JAN 31 1921

Railway Age

FIRST HALF OF 1921—NO. 4 NEW YORK—JANUARY 28, 1921—CHICAGO SIXTY-SIXTH YEAR

KERITE INSULATED WIRE & CABLE COMPANY

NEW YORK CHICAGO

"H B" AND "AJAX" IRON CHAINS

ACCO CHAINS—The chains with reserve strength built into every link, the chains which always stand the strain.

AMERICAN CHAIN COMPANY, Inc.

Bridgeport A·C·C Connecticut

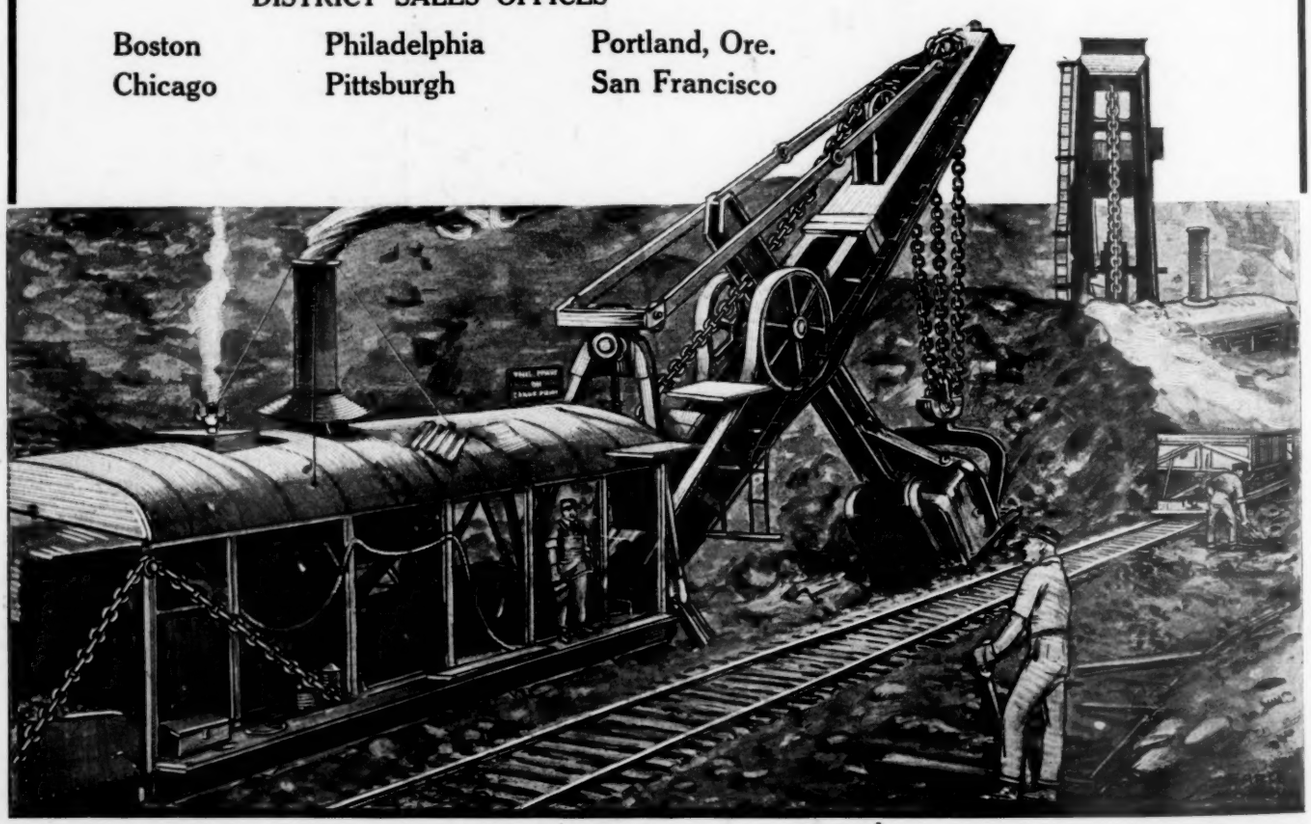
IN CANADA: DOMINION CHAIN CO., LTD., NIAGARA FALLS, ONT.

LARGEST CHAIN MANUFACTURERS IN THE WORLD

General Sales Office:
Grand Central Terminal, New York City

DISTRICT SALES OFFICES

Boston	Philadelphia	Portland, Ore.
Chicago	Pittsburgh	San Francisco



Vol. 70 Published weekly by Simmons-Boardman Pub. Co., Woolworth Bldg., New York, N. Y. Subscription Price U. S., Canada and Mexico, $8.00; foreign countries (excepting daily editions), $10.00; single copies, 25c. Entered as second-class matter, January 30, 1918, at the post office at New York, N. Y., under the act of March 3, 1879. No. 4

EDITORIAL

Railway Age

The Table of Contents Will Be Found on Page 5 of the Advertising Section

Does Every Division Practice Economy?

The divisional form of organization presumes an adequate degree of supervision by the system officers to insure uniformity of practices on the several divisions. In the maintenance of way department this implies the employment of staff officers possessing thorough familiarity with the physical conditions of the entire system, whose duty it is to supervise and inspect the work being done on the various divisions. That the value of this supplemental supervision is recognized is demonstrated by its adoption in one form or another by practically all roads committed to the divisional organization. Such supervision was never more important than at present when the greatest economy must be practiced. Steps to curtail expenditures always meet with direct or indirect opposition from the divisional or subdivisional officer who brings forth every evidence to demonstrate the dire need of his own territory in an effort to obtain some measure of relief from the operation of the orders for retrenchment. It is only through a detailed knowledge of the entire property by staff officers with special training and time to look after such matters that the management can be enabled to enforce a uniform practice of economy on the entire system.

No Change in Plans for Engineering Week

As stated elsewhere in this issue, the plans for the convention of the American Railway Engineering Association are nearing completion. The convention will be held in Chicago during the third week in March according to the precedent established by this organization during the 22 years of its existence. By the same token the officers of the National Railway Appliances Association are perfecting all arrangements for the exhibit which will be held at the Coliseum and annex simultaneous with the association convention. The fact that the Signal division of the American Railway Association has decided to abandon its one-day stated meeting scheduled for March 14 will in no way affect the plans of the other two organizations for "Engineering Week" at Chicago. Officers of the American Railway Engineering Association have stated that there is absolutely no ground for the rumors that this association has planned to abandon its three-day meeting scheduled for March 15-17, inclusive, while the records of the National Railway Appliances Association show that the members have already contracted for nearly all of the display space available.

Utilize Present Shop Equipment More Effectively

During the past few weeks several railroads have sent out inquiries regarding substantial lists of railroad shop equipment, particularly machine tools, and this fact indicates a growing appreciation of the urgent need for such new equipment. There is little question as to the placing of large orders when the financial situation clears at Washington and the railroads are enabled to obtain partial payments on their guaranteed returns. Pending the installation of new machinery, however, much can be accomplished to increase the efficiency and output of railroad repair shops by making better use of present equipment. The output of many heavy repair shops is limited by the capacities of the respective machine departments and it is here that a little attention will pay the largest returns. Many old machine tools are too hopelessly out of date to be renovated or modernized, but in some cases desirable results can be secured by providing a more powerful drive, increasing the speed or feed range, or possibly strengthening the machine at a weak point. In any case, it is advisable to develop in every shop a competent repair gang charged with the duty of carefully and periodically inspecting all machines and keeping them keyed up for maximum production. In this way weak points in the machinery will be discovered and many breakdowns, with their resultant delays, prevented. Perhaps the most prolific source of increased machinery output with present equipment is in the design and application of time-saving jigs and fixtures. Careful attention to the individual job will show what operation consumes the most time and in many cases a little ingenuity will suggest some simple jig or fixture capable of reducing the time required for the operation by fifty per cent or more. In this connection a word of warning should be uttered against the man who would spend *all* his time designing time-saving devices. Common sense will show where to draw the line between efficient devices and complicated ones which cost more than they save.

Stock Without Par Value

No opposition developed at the hearing in Washington on Monday on the application of the El Paso & Southwestern Company to the Interstate Commerce Commission for permission to increase the company's authorized capital stock from 350,000 shares of $100 par value to 1,000,000 shares of no par value, and to issue of the latter stock without par value 750,000 shares in exchange for the 250,000 shares of stock of $100 par value now outstanding. The novelty of the plan proposed will undoubtedly attract no small amount of attention. The use of stock without par value is a new development as far as railroads are concerned. A number of industrial companies have issued such stock. The Federal Securities Commission of 1910 endorsed the idea in its report and gave extensive reasons for its endorsement. The reason given in the railroad's application was briefly that inasmuch as the value of the road is changing from time to time, as additions and betterments are made, etc., if the outstanding stock is without par value, it will conform more closely to the actual value of the road at all times. The application, however, did not state any particular reason the company may have had in mind for taking its proposed action at this particular time. The El Paso & Southwestern Company is controlled by the Phelps-Dodge interests. It is a holding company and owns directly or through subsidiaries or leases the lines which make up the El Paso & Southwestern system. The stock of the El Paso & Southwestern Company outstanding is $25,000,000; it has no bonded debt, although there are bonds outstanding of various of the subsidiary companies. The investment in road and equipment as of December 31, 1919, is given as $7,124,715, the invest-

ment in affiliated companies as $34,156,431 and other investments, $1,423,990, a total of $42,705,136. On December 31, 1919, there was a corporate surplus of $16,327,599. A perusal of these various facts fails to show what the company may have in mind, unless it be to capitalize its surplus as the Burlington and Lackawanna are proposing to do. That, however, will probably be brought out in later developments as well as some interesting discussion, no doubt, on the idea of railroads issuing stock without par value.

The Chilean Loan

The series of articles by J. P. Risque on the railways of Chile which began in the *Railway Age* of two weeks ago has proved more timely than was perhaps expected. Press despatches from Chile this week are authority for the statement that the Chilean government is renewing its attempt to place a loan for $25,000,000 to be used principally for additions and betterments to the state railways. The Minister of Finance is quoted as saying that the loan will bear interest at not more than 8 per cent and will be repaid by a fund created by setting aside 15 per cent of the gross revenues of the state railways. He is also quoted as saying that negotiations are going on in Europe as well as in New York and that the loan will be placed, naturally, in the place where the best terms are offered. The Chilean government has had this loan in mind for some time, and its progress or rather lack of it has been watched with interest. The friendship of the Chilean railway men for American railroad methods is well known and has been already pointed out in Mr. Risque's articles. The placing of the loan, however, is perhaps a more substantial factor, for it is generally the case that orders for equipment and supplies go to the country which supplies the funds. There can be little doubt, in other words, that if the Chileans can come to terms with the New York financial interests, there will be compensating orders for American railway material. Conversely if the loan is placed in Europe the Chilean requirements will presumably not be placed in this country despite the underlying friendship for American ways of railroading.

Maintain the Present Differential

A year or two ago when the people of the various States authorized enormous bond issues for highway construction no little anxiety was felt by many railway engineering executives in anticipation of the depletion of their staffs in consequence of the opening up of such a large field of employment for engineers. Fortunately for the railroads, this competition has not materialized. Subsequent developments have resulted in delaying the full force of the wholesale highway construction but facts more recently brought to light are most illuminating in disclosing the real reason why railway engineers as a class have not been attracted to highway construction. The answer is an old one—inadequate compenstation. This has been brought out emphatically in a bulletin issued by the American Association of Engineers calling attention to the fact that the salaries being paid by the various State highway commissions to their engineering employees and officers are woefully out of proportion to the responsibilities of the positions. A study of tables showing salaries paid in the various States shows that the rates are appreciably below those paid by most of the railroads for corresponding positions. This is particularly the case with the executive officers. The average salary paid to chief highway engineers in the 48 states is $5,372, with a maximum of $10,000 and a minimum of $3,000. Bridge engineers in only four States are paid in excess of $4,000. Construction engineers receive from $2,400 to $5,000, and district engineers from $1,800 to $5,000. But even in the lower positions of inspector and instrumentman the scale is generally below that of the railroads. While these facts will be pleasing to the railway managements, they offer no excuse for an attitude of complacent assurance. The present rates paid the engineering staffs on railroads are in large measure the result of circumstances obtaining during the period of government control and with the present period of reduced construction activities, there will be an unquestioned tendency to reduce the average compensation to the engineering forces. A pursuance of this policy would soon wipe out the differential between railway and highway work and result in harm that would far exceed the saving in salaries.

The Port of New York —A National Problem

GENERALLY STATED the great majority of the American people are unaware of the bearing which the Port of New York has upon their affairs either in a business or a personal way. Fully one-half or more of the import and export traffic of the entire country passes through this port—a port where freight handling costs are manifestly too great. The problem is essentially a national one. Any solution that will reduce operating and freight handling costs will not only benefit the people in the immediate locality and the twelve large railroads entering the port, but will eventually benefit industry the country over.

The railroads in this district are actually losing money on the freight handled by car ferries or lighters. According to the studies of the New York-New Jersey Port and Harbor Development Commission, whose report is abstracted elsewhere in this issue, the average terminal allowance at New York is from 60 cents to 80 cents per ton while it actually costs from $2.25 to over $3 per ton to handle freight from the New Jersey yards to Manhattan piers. While the present system does move the freight in a fashion it is far from satisfactory or economic. The realization of this was one of the causes underlying the appointment of the Commission in 1917 to study the situation and to report a plan to remedy it. The system proposed by the Commission after three years of study and field work has many strong points, besides the fact that it can be built and placed in operation without any disturbance of existing methods. Under its operation the present average of 3½ days per car from the New Jersey yards to Manhattan and return will be reduced to 36 hours or less, an estimated saving of about one and one-half million car days under present traffic conditions. Better use of cars will result from the use of the joint yard to be built in New Jersey, while the movement of empty cars across the river—about 25 per cent of the total cars moved—will be automatically obviated. There are also other advantages that should have a marked bearing on the adopticn of the plan. On the other hand, the greatest difficulty probably is that it will be necessary to overcome that of gathering together all of the loose strings of municipal authority scattered throughout the New York-New Jersey port district into one centralized directing management or port authority as the Commission calls it. Politics and petty municipal jealousies have undermined many other plans and it is probable that they will be once more at work in this instance. Yet this difficulty does not appear insurmountable by any means in this case for the legislatures of the two states seem to have realized at last that something vital must be done and done soon.

For the physical plan, certainly one feature, that of the

automatic-electric subway system, will receive its share of comment, discussion and, no doubt, disparagement. While a radical departure in port methods, it is not entirely new. In London, England, the post office department is now completing a similar installation, 6¾ miles long, to operate at speeds up to 35 miles an hour and for which equipment is now being purchased. The studies and tests for this London project extended over a period of ten years before it was finally adopted. The Commission in evolving its plan received the advice and assistance of the leading electrical engineers, transportation and conveyor men of the country as well as the indorsement of leading electrical manufacturing companies as to its practicability. While an innovation it is exceedingly well planned out, its cost is lower than any of the other proposed systems, and its capacity in tonnage is far greater. It is easily capable of expansion and offers numerous possibilities for the efficient rearrangement of present steamship facilities and distributing centers. It is independent of weather, harbor strikes, and, to a far greater degree than ever before, to labor difficulties in general. Taken altogether it is worthy of the closest study and consideration for it is the most comprehensive plan that has as yet been evolved.

One Reason Why Railway Expenses Are So Enormous

WHILE THE RAILWAYS are fighting before the Railroad Labor Board against continuance of the efficiency destroying national agreements made by the Railroad Administration with certain labor brotherhoods, the Interstate Commerce Commission has made public some statistics which would have been issued in the ordinary course of events but which have a very direct bearing upon the matters immediately in issue before the Labor Board.

The statistics of the commission show, for one thing, that in the first eleven months of 1920 the railways spent $813,500,000 more for the maintenance of their locomotives and cars than in the same months of 1917. The cost of maintenance of equipment in the first eleven months of 1917 was $630,000,000, while in the first eleven months of 1920 it was $1,443,500,000, or 130 per cent more. Almost simultaneously the commission made public statistics showing that in March, 1920, the Class 1 railways had 2,009,948 employees, or 277,012 more than in 1917.

What bearing have these figures upon the subject of national agreements? In the first place, witnesses for the railways before the Labor Board have shown that under the operation of the rules of the national shop crafts agreement they are being compelled to pay employees in the shops many millions of dollars annually for work which is not done. This partly accounts for the enormous increase in the cost of maintaining locomotives and cars. In the second place, witnesses for the railways in every section of the country have been showing for a week how the abolition of piece work in the shops, and the substitution of the hourly basis of pay which the national agreements would continue, has resulted in reductions in the amount of work done per employee of from 10 to 50 per cent.

Some of the facts regarding the reduction in the efficiency of labor which followed the abolition of piece work which have been given in the testimony before the Railroad Labor Board are positively startling. It has been testified, on the basis of careful statistical studies, that in the shops of the Chesapeake & Ohio the output per man declined from 11 to 40 per cent. In the main shops of the Union Pacific it declined from 21 to 29 per cent. In the shops of the New York Central, between 1917 and 1920, the number of hours of work for which the railway paid increased 53 per cent, while the total output of the men who did the work increased only 14 per cent. The time required to perform certain operations in the locomotive erecting shop and foundry of the Baltimore & Ohio at Newark, Ohio, and in its shops at Baltimore, Md., increased from 6.7 to 200 per cent. In the shops of the Pennsylvania the abolition of piece work has reduced the average output per man almost 27 per cent. In the car repair shops of the Chicago & North Western the decline in efficiency was 36 per cent.

The necessary effect of the establishment of the eight-hour day and decline in the efficiency of labor was to cause a large increase in the number of men who had to be employed to do the same amount of work. It is not, therefore, surprising to find from the statistics of the commission that while in 1917 the railways had 264,586 machinists, boilermakers, blacksmiths, painters and upholsterers, electricians, air brake men, car inspectors, car repairers, and machinists' helpers and apprentices, in March, 1920, they had 378,238 of these classes of employees, an increase since 1917 of 113,652. The percentage of increase in all the employees of the railways between 1917 and 1920 was 16 per cent, while the percentage of increase in the number of shop employees of the classes just mentioned was 43 per cent.

Here, then, are the facts briefly summarized. The employees in the shops in 1917 were working on a ten-hour basis, while in 1920 they were working on an eight-hour basis. For working on an eight-hour basis they are now receiving 72 per cent higher average monthly wages than they received in 1917 on a ten-hour basis. The abolition of piece work has resulted in a heavy reduction in the average work done per man, not only per day, but per hour; and because of this and the eight-hour day the railways are being obliged, or were when business was heavy, to employ 43 per cent more men in their shops than in 1917. Nor is this all. In spite of the great increase in the number of men employed in the shops, the railways were unable in 1920 to do in their own shops all the repair work on locomotives and cars required, and consequently had to send a substantial part of their equipment requiring heavy repairs to outside plants, which further greatly increased the expense of maintenance of equipment.

Is it any wonder, in view of such facts as the foregoing, that the cost of maintenance of equipment increased 130 per cent within three years? Largely because of this increase in the cost of maintaining equipment the public is today paying higher freight and passenger rates than ever before, and yet the railways are failing to earn the average return of 6 per cent on their valuation which the Insterstate Commerce Commission has held they need. The public caused the railways to be returned to private operation because it believed that under private management they would be more economically operated than under government management, but the railways cannot be more economically operated under private than under government management unless they are given the opportunity to adopt the methods which are absolutely essential to increasing economy and efficiency. The national agreements, by forcing the railways to pay out many millions of dollars for work which is not done, by preventing them from establishing piece work in their shops, and by interposing other formidable obstacles in the way of increasing efficiency, are among the things which thus far have rendered it impossible for the managements to effect the large economies which they ought to effect, and are seeking to effect, not only in their own interest but in the interest of the public which pays the passenger and freight rates.

The railroads in this matter really are fighting the battle of the public, because unless operating expenses can be reduced it will be impossible for freight and passenger rates to be reduced, and they may have to be increased. In this fight, therefore, the railways ought to have the backing of an aroused and effective public sentiment.

Supreme Court on the Paterson Crossing Case

THE SUPREME COURT of the United States, in its decision holding that the Erie Railroad must obey the order of the New Jersey Public Utility Commission to elevate its tracks in Paterson at great expense to cross fourteen streets, says that intelligent self-interest should lead the state to consider carefully what the road is able to do without ruin; but that this is not a constitutional duty. The court below approved the conclusion of the public utility commissioners that the expense would not be ruinous. "It is difficult to avoid the apprehension that the officers of the state hardly gave due weight to the situation of the company as a whole," but they did not exceed their constitutional powers, says the court. For delicate shadings of opinion, this wording would be hard to beat. The state puts a very large special financial burden on the railroad company, at a time when, because of state-limited fares and freight rates, its every-day expenses are abnormally burdensome, and the only comfort our nine impartial arbitrators can offer to the railroad is that the state is not bound by the constitution to exercise intelligent self-interest! The authorities of the state must know that the people need the railroad, but there is no obligation resting on them to refrain from starving it to death. It is difficult not to see that the state, in its blindness, has oppressed the railroad; but there is no law to remedy matters.

This decision comes very near paralleling the colloquialism that there is no law forbidding a man to make a fool of himself. It would be interesting to be able to put in words the thoughts of the three minority judges—who dissented without saying why they did. The "apprehension" that the state had been unreasonable with the railroad company evidently was, in their minds, very well-defined. It is a familiar fact that a good many public servants—congressmen, for example—consistently follow the theory that full justice will be done by giving the railroads a little real nourishment after it has become indubitably apparent, to the blindest person in America, that they are actually starving to death—not merely threatened with death. This has been the case for years. The disturbing fact today is that, in spite of the enlightening experiences of the past three years, the exponents of this theory often manifest as vigorous a life as ever they did in the past; and that our democratic constitutional ideals, as expounded by our court of last resort, seem to afford no relief. General Grant said that, to get rid of a bad law, enforce it—often a very slow process. To get rid of a fault in the constitution is still slower.

What Is the Service of Supply?

IT IS WITHIN the recollection of many that the purchase and distribution of supplies required by the railroads was entrusted to the departments who made use of the materials. The stores department was then the logical outcome of an attempt to specialize on the distribution of supplies and as railway purchases grew to enormous proportions the purchasing department became an obvious necessity. But to assign to them merely these routine functions is to lose sight of one of the most potent possibilities for improving the management of our railroads. This lies in the execution of a policy that will insure the full utilization of every single item of material. The purchase of an article at the lowest price quoted and its delivery to any point on the railroad with the least expense is a comparatively simple matter to which good judgment, good organization and scientific methods all contribute. But to know that this article is actually needed, that it will be used to the best advantage within a short interval after it is purchased and that there is not a surplus of the same article at some other point on the railroad that will obviate the necessity for purchase, calls for broader and more comprehensive action.

It may be argued that the department which uses the material is best qualified to estimate its future requirements. But is this a fact? Today, it is almost impossible to find a large railroad on which there are not quantities of materials which will last for months or years that the mechanical, the engineering or some other department *thought* they would need at once. These departments are not to blame; they were expected to have all the supplies they needed and they invariably ordered enough to be on the safe side. Now they are not expected to order anything and eventually the scarcity of many materials will become as deplorable as the present surplus. The truth is that few railroads analyze their local conditions and base their estimate of future needs upon careful study of fundamental conditions rather than upon a temperamental Wall street. The growing boy who receives a new suit of clothes during every interval in which he gains a few inches in height is fortunate but the "feller" who is showered with clothes only when his dad has a lot of surplus cash "needs a friend."

It should be somebody's business to study the recurring needs of every railroad and to map out a program for material purchases that is based on the actual growing needs of the property rather than upon earnings. The supply department through its extensive organization should be able to gage the future needs of every railroad just as the traveling salesmen of some of many progressive mercantile concerns estimate and report upon the consuming capacity of territory with which they are intimately acquainted. The purchasing department through its knowledge of market conditions should know when and how the railroad can buy to the best advantage. Hence the service of both of these departments is indispensable to a logical determination of the material requirements of a railroad. It is only by the association of these two departments presided over by a chief supply officer that a real service of supply can be established. It would be impossible to describe the service of supply to better advantage than outlined in the article on "The Service of Supply as a Business Institution," appearing elsewhere in this issue.

New Books

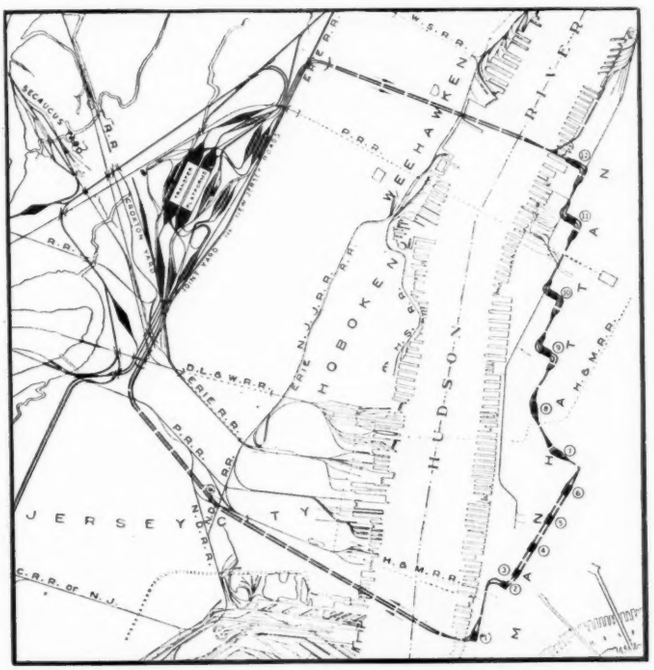
Proceedings of the American Society for Testing Materials for 1920. *Two volumes* 6 *in. by* 9 *in.,* 1,360 *pages. Bound in cloth. Published by the American Society for Testing Materials,* 1315 *Spruce Street, Philadelphia, Pa.*

These volumes contain the proceedings of the twenty-third annual meeting which was held at Asbury Park, N. J., on June 22-25, 1920. The first volume contains the committee reports and tentative standards. Among the reports of particular interest to railway men are those on the Proposed Revisions in Standards and Tentative Standards for Steel, Corrosion of Iron and Steel, Cement, Reinforced Concrete, Concrete and Concrete Aggregate, Preservative Coatings for Structural Material, Methods of Sampling and Analysis of Coal, and Shipping Containers. Among the tentative standards incorporated in this volume are those for steel, tie plates, boiler and firebox steel for stationary service, carbon tool steel, low carbon steel track bolts, non-ferrous alloys for railway equipment, bronze bearing metals for turntables and movable railroad bridges, and babbitt metal. The second volume contains the technical papers presented before the convention, including one on The Shattered Zone in Certain Steel Rails with Notes on the Interior Origin of Transverse Fissures by J. E. Howard and another on the Effect of Hydrated Lime.

Proposed Reorganization of the Port of New York

Special Automatic-Electric Subway System Feature of the New York-New Jersey Commission Report

AFTER MORE THAN THREE YEARS' intensive study and planning the New York-New Jersey Port and Harbor Development Commission has completed its plan for the reorganization of the Port of New York and has submitted it to the state legislatures. The report covers not only the plan recommended but also contains the results of studies relative to possible solutions to the problem by means of overhead and underground systems connecting New York and New Jersey for the use of standard equipment; motor truck service; cableway truck conveyor service and improved



Initial Development of the Automatic-Electric System

water transfer service, all of which however were found unsuitable.

The New York-New Jersey Port and Harbor Development Commission consists of William R. Willcox, chairman; J. Spencer Smith, vice-chairman; Eugenius H. Outerbridge, DeWitt Van Buskirk, Murray Hulbert and Frank R. Ford. Major-General George W. Goethals is consulting engineer; B. F. Cresson, Jr., chief engineer; Julius Henry Cohen, counsel; William Leary, secretary, and C. A. Ruhlmann, assistant secretary.

The Comprehensive Physical Plan

A complete reorganization of the railroad terminal system is the most fundamental physical need, such a reorganization involving new methods of handling freight from the break-up yards of the railroads. The plan recommended calls for improving and opening up for joint use the existing belt-line links in New Jersey and constructing other belt lines along navigable New Jersey waters and farther inland; building similar marginal railroads along navigable waters adjacent to Brooklyn, Queens, Staten Island and the Bronx and utilizing with them the Long Island and the New York Connecting Railroad to form a belt-line system in New York; connecting the New Jersey and New York belt systems, at first by car ferry and ultimately by tunnel under the Upper Bay; operating all of these lines jointly and operating jointly, through new joint railhead terminals, all railroad marine service not replaced by other service; and building an underground railroad system carrying special electrically operated cars, connecting with all of the railroads of the port, serving virtually all of Manhattan and enabling the railroads to discontinue their pier stations and consequently release the waterfront to other uses.

Present Railroad Operations

Twelve railroads, exclusive of purely local enterprises, come to the Port of New York. Nine of these enter the district from New Jersey, have their railheads in New Jersey or Staten Island, and are referred to as the New Jersey railroads. The remaining three enter from New York, terminate in New York and are referred to as the New York railroads.

The commission's analysis, which it believes to be more accurate than any previously attempted by any agency, gives the following figures for operating costs in 1914: For goods handled at Manhattan car-float pier stations or inland rail stations, $1.60 per ton; for goods handled at Brooklyn, Harlem or Bronx stations, $1.48 per ton; for goods lightered, $2.14 per ton.

On the basis of 1918 prices, which are obviously much higher than those of 1914, the commission estimated that the total terminal costs to the railroads were about $2.25 per ton for freight handled to or from Manhattan stations, $2.08 for that handled to or from Brooklyn, Harlem or Bronx stations and $3.01 for freight lightered. Considering the tonnage at the Manhattan stations alone, which amounted in round numbers in 1918 to 8,500,000 tons, the cost of the terminal operations at $2.25 per ton was about $19,125,000. Assuming an average terminal allowance for this freight of 75 cents per ton, the total allowance would be $6,375,000 and the deficiency of the terminal charge in the single year on the one class of freight would be $12,750,000.

Initial Development of Automatic-Electric System

In the initial development it is proposed to link up the New Jersey railroads by a belt line along the eastern margin of the Hackensack Meadows and build a joint railroad yard in New Jersey east of the Croxton yard of the Erie. The automatic-electric tracks will start from this joint yard in New Jersey, pass under Bergen Hill and the Hudson River to a point in Manhattan at about Forty-seventh street, thence turn southerly and pass under certain streets suitable for the location of convenient terminals, turning back to the joint yard via another set of tunnels in the vicinity of Battery Place.

A consignment of freight for one of the Manhattan terminals, coming in a train with freight for other parts of the port district, will enter the existing break-up yard of the railroad company. Here the standard railroad cars will be classified as at present, and the car containing this shipment together with others containing other freight for Manhattan will be delivered to the public or private company operating the terminal system at the intersection of its belt line with the railroad company's line. The standard railroad cars will be hauled to the joint yard and placed in a

receiving yard, whence they will be switched to tracks alongside the inbound ends of long transfer platforms.

Each of these platforms, 24 in number, will have a standard-equipment track on one side and an automatic-electric track on the other side. The freight will be unloaded from the standard railroad car upon trailers about 3 ft. by 6 ft., and the trailers will then be hauled by tractors or by hand along the platform and placed upon one of the automatic-electric cars, which will hold 12 trailers. The standard railroad car will be pushed along the platform to the outbound end and reloaded with outgoing freight from other trucks, whence it will pass into an advance yard and be despatched to the railroad from which it came, or to any other railroad to which it is to be delivered.

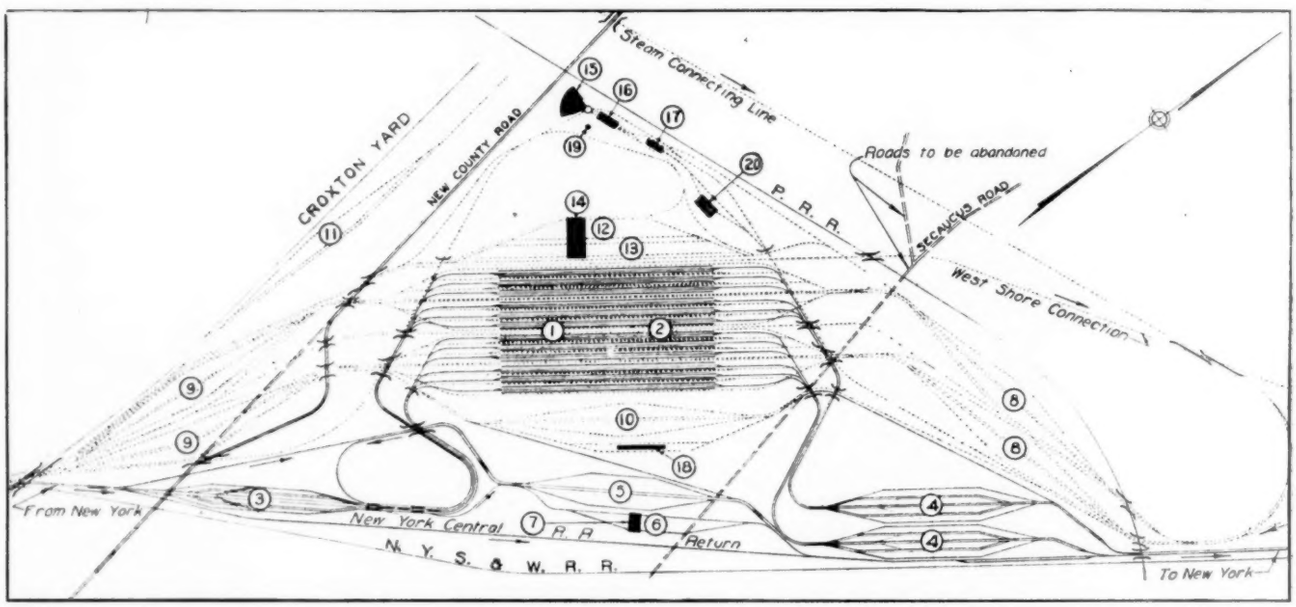
The consignment of freight will meanwhile have been loaded upon one of the special electric cars—a car somewhat larger than the ordinary box car, with a roof to protect its contents, but roll sides to permit trailer trucks to be wheeled upon it at any point.

This car, controlled from alongside by a switch on the car within reach of an operator on the transfer platform or on the ground, will move from the platform at a low rate of speed (from 2.2 to 6.6 miles per hour) and be switched to a track assigned to the particular terminal to which the freight is destined, freight for only one terminal having been placed on the car. When sufficient automatic-electric cars have been accumulated, eight will be coupled together and despatched in a train. This train, with no other manual direction than the throwing of the track switch, will be accelerated to a speed of 1,200 ft. per min. (13.2 miles per hour) and take its place at not less than an established distance behind another train probably destined for a different terminal. The train will bear a distinctly visible indication of its destination, and when it reaches the entrance of its terminal an operator will throw a switch and divert it to a siding, where brakes will automatically be applied and it will come to a stop.

From this siding the automatic-electric cars will be run singly at slow speed upon an elevator. The elevator will raise the cars one at a time to an inbound platform at the street level and the cars will be run off under their own power. This platform will be the length of several cars, and each car will remain alongside the platform a minimum of 12 minutes, affording ample time for the wheeling off of the trailer trucks and the wheeling on of empty trucks. The consignment will be placed on the platform to be called for, as at the ordinary freight house, or removed to storage if the consignee fails to call for it within the free time limit.

The automatic-electric cars, having discharged their loads and received empty trailers, will be advanced one by one to a second elevator, which will lower them one floor to the outbound platform at the basement level. Here the cars, after having again at least 12 minutes in which to unload their empty trailers and receive loaded trailers with outbound freight, each car receiving freight for a single railroad, will proceed back to the original elevator shaft. The cars will then be run upon the first elevator and be lowered to the track level, this elevator having meanwhile made several trips and brought other cars to the inbound level.

Running off the elevator at the side-track level, the automatic-electric cars will be held until eight have accumulated, when they will be coupled and despatched as a train by exactly the same process as from the New Jersey yard, on interlocking signal system controlling the time when the train shall enter the main-line system.



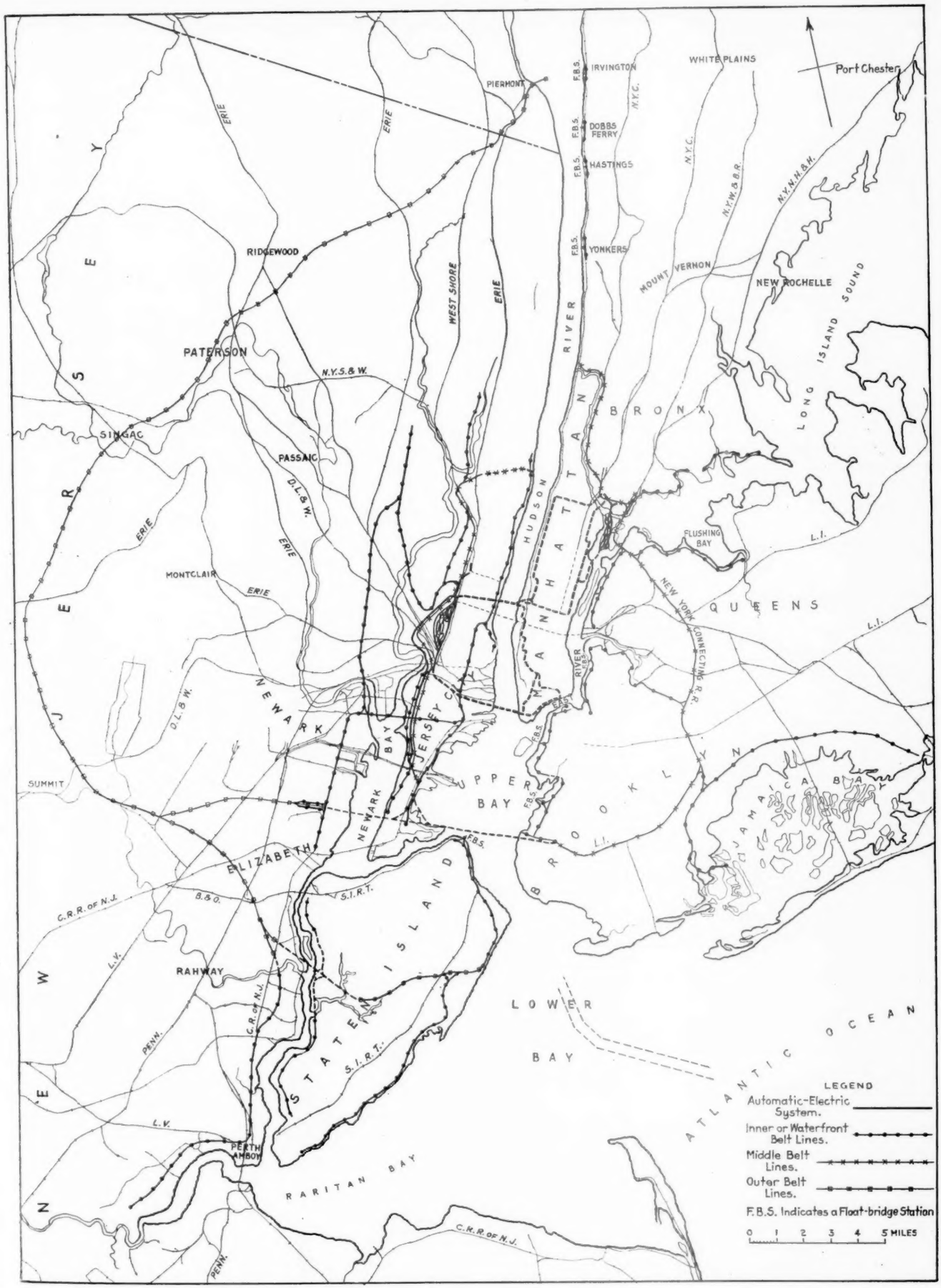
General Plan of Steam and Electric Joint Yard in New Jersey

Nos. (1) and (2) designate inbound and outbound transfer platforms; (3) outbound electric receiving yard; (4) inbound electric forwarding yards; (8) inbound steam receiving yards; (9) outbound forwarding yards; (10) electrified storage yard.

Arriving at the joint yard, the train will be switched to one of the tracks of a receiving yard, where it will be brought to a stop automatically as before. Here the automatic-electric cars will be cut off one at a time, and started by an operator walking alongside, the cars moving at a speed of 2.2 miles per hour. They will proceed over a series of switches and crossovers, controlled from a central tower, by which they will be diverted to the proper tracks at the transfer station.

The cars will be stopped at the outbound ends of the transfer platforms. The loaded trailers will be removed and transferred to standard freight cars, other trailers previously emptied will be hauled by tractors along the platform to the inbound end of the platforms, the empty automatic-electric cars will be advanced to the inbound section of the transfer station to receive new loads, and the cycle will have been completed.

An important feature of the automatic-electric system is the contemplated trailing dead section of track, which will


Port Chester
WHITE PLAINS
IRVINGTON
PIERMONT
DOBBS FERRY
HASTINGS
YONKERS
MOUNT VERNON
NEW ROCHELLE
LONG ISLAND SOUND
RIDGEWOOD
PATERSON
SINGAC
PASSAIC
MONTCLAIR
NEWARK
ELIZABETH
SUMMIT
RAHWAY
PERTH AMBOY
STATE ISLAND
UPPER BAY
LOWER BAY
RARITAN BAY
ATLANTIC OCEAN
BRONX
MANHATTAN
QUEENS
BROOKLYN
JAMAICA BAY
FLUSHING BAY
NEW YORK CONNECTING R.R.
HUDSON RIVER
NEWARK BAY
ERIE
WEST SHORE
N.Y.S.& W.
D.L.& W.
C.R.R. of N.J.
B.& O.
L.V.
PENN.
S.I.R.T.
N.Y.C.
N.Y.N.H.& H.R.
N.Y.W.& B.R.
F.B.S.
L.I.
LEGEND
Automatic-Electric System.
Inner or Waterfront Belt Lines.
Middle Belt Lines.
Outer Belt Lines.
F.B.S. Indicates a Float-bridge Station
0 1 2 3 4 5 MILES

make it impossible for one train to come closer than a certain safe distance from the train preceding.

A special connection is required in the initial development to accommodate the New York Central. It is proposed to establish at the New York Central's Sixtieth Street yard a transfer station similar in character to that in New Jersey, from which will be constructed a double-track connection to the main loop.

Incoming New York Central trains of automatic-electric cars will enter the main system at this junction and pass south into the terminal system in the same direction and in the same manner as New Jersey automatic-electric trains until they reach the desired terminal. Outgoing New York Central automatic-electric trains will continue south, follow the south tunnels to New Jersey, be detoured around the joint yard, come back upon the main system at the north end of the joint yard, move east through the main system and be switched to the spur running to the Sixtieth Street yard.

Inasmuch as the Manhattan terminals and main line of the proposed automatic-electric system are to be located inland from the waterfront, and the New Jersey belt line and joint yard will be on ground at present unoccupied in the Hackensack Meadows, the initial development of the automatic-electric system as outlined in the preceding paragraphs can be constructed, equipped and placed in operation without in any way hampering the operation of present facilities. The importance of this feature will be realized when it is considered that the estimated period required for the construction of this system under the most favorable circumstances is three years.

The Manhattan Terminals

Twelve Manhattan terminals will be required immediately. Five more, it is estimated, can subsequently be added before the terminal capacity reaches the capacity of the joint yard and main tracks. Much depends upon the design of the terminals in Manhattan. Abundant driveway and platform space have been provided, inbound and outbound freight will be handled at different levels, and the arrangement of the driveways is such that there will be no conflict of trucks coming to the terminal for different purposes, the traffic on certain of the adjacent streets being restricted to one-way operation. To provide ample space for holding inbound freight awaiting consignee, and storage space as well for spare trailer trucks, it is proposed to build a floor above the inbound level as a part of each terminal. Above that it is proposed to build two additional stories for warehouse purposes, and it is estimated that the revenues that can be obtained from these additional floors will contribute materially to a reduction of the fixed charges against the system. Besides the two warehouse floors incorporated in the design, estimates have been made of the extra cost of and revenues obtainable from two additional floors per terminal for loft, manufacturing or office purposes.

Assurance against complete suspension of service through accidents is important in a system such as the automatic-electric. This is provided in large measure by the division of the plant into two separate and parallel systems. There are two main tracks, each with its own tunnels, each with its terminals complete as to sidings, elevators and platforms.

The New Jersey Joint Yard

There will be three principal elements in the New Jersey joint yard: A steam section for standard railroad equipment, an electric section for the automatic-electric cars, and a series of platforms for the transfer of freight by trailer or otherwise between the two kinds of cars. Standard freight cars handled by yard locomotives will be put through the steam section from north to south without back-up movement, first discharging their freight and then reloading, while the automatic-electric cars will pass through in the opposite direction, also without back-up movement. Grade crossings of steam and electric tracks will be avoided by the elevation of the electric tracks at the crossing points beyond the ends of the platforms.

The steam section of the yard will have three main units —a group of inbound receiving yards, a transfer-platform unit and a group of outbound forwarding yards—in addition to which there will be miscellaneous facilities incidental to most large railroad yards.

The electric section of the yard will also consist of three main units—an outbound receiving yard, transfer-platform tracks and inbound forwarding yards—in addition to which there will be miscellaneous facilities within the yard proper, and bypass tracks alongside the yard for New York Central outbound trains. The automatic-electric cars will have to be classified twice, once to reach the proper platforms for discharging their outbound loads, and once after receiving inbound loads to be made into trains.

Comparative Capacities and Costs

With twelve Manhattan terminals the initial development of the automatic-electric system, normally operated ten hours a day, has an estimated capacity of 10,000,000 tons yearly, the tonnage expected in 1929. The estimated yearly capacity of the steam belt line, joint yard and Hudson River tunnels is 14,260,000 tons, and the capacity of the entire system can be brought to that figure by building five additional terminals. The capacity of the present facilities is indeterminate, but the congestion at times indicates that it is not in excess of the present peak loads. Table 1 compares the capacities of the recommended system and the present facilities, the capacity of the latter being assumed as that of the maximum short-period traffic found by the clockings sustained for a year.

TABLE 1—ESTIMATED MAXIMUM CAPACITY

	Tons of Freight per Year	
Automatic-electric system	14,260,000	
Present car float-pier station system	8,000,000	
Added capacity	6,260,000	77.8 per cent
Standard-equipment elevated system	6,115,000	
Standard-equipment underground system	6,115,000	

The capacities of the elevated and subway systems for standard equipment which were studied by the commission but rejected, are also shown for comparison. They, moreover, are based on operation for 24-hour days.

TABLE 2—ESTIMATED COST OF CONSTRUCTION AND EQUIPMENT AT 1918 PRICES

Automatic-electric system	$201,190,000
Standard-equipment elevated system	241,131,000
Standard-equipment underground system	255,009,000

Table 2 shows for comparison the estimated costs of construction and equipment, ready to operate, of the automatic-electric, the standard-equipment elevated and the standard-equipment underground systems. The automatic-electric figure covers 12 Manhattan terminals. All three figures are based on 1918 prices, which the Commission deems as nearly normal for the future as can be obtained. Amortization of the entire investment in 50 years is provided in all of the automatic-electric estimates that follow, but not in those for the other systems.

TABLE 3—ESTIMATED COST OF MOVING 10,000,000 TONS OF FREIGHT FROM BREAK-UP YARDS TO MANHATTAN STATIONS AT 1918 PRICES

	Per Ton	Ten Million Tons
Present car float-pier station system	$2.25	$22,500,000
Automatic-electric system	1.82	18,200,000
Saving, automatic-electric system	$0.43	$4,300,000
Standard-equipment elevated system	$3.47	$34,700,000
Standard-equipment underground system	3.66	36,600,000

Table 3 shows the estimated cost per ton of operating

each plant, and the costs at those rates for moving 10,000,000 tons of freight per year. The automatic-electric system alone has a 10,000,000-ton capacity, but to show the other systems as favorably as possible this fact is disregarded. Expanding them to the desired capacity would require much new construction, entailing additional fixed charges that would undoubtedly keep the unit costs of operation, which include both direct costs and fixed charges, at least up to the figures recorded.

Thus the advantage of the automatic-electric system over either standard-equipment system is overwhelming in capacity and cost of operation, with less capital investment, and consequently the standard-equipment system can be excluded from further consideration.

Expansion of System

The initial development of the automatic-electric system described in the foregoing paragraphs solves the West Side problem south of Fifty-ninth street and gives adequate relief where it is most necessary. It leaves to be provided for by expansion of the system the inclusion of the New York, New Haven & Hartford and the Long Island and the removal of the New York Central tracks through Riverside Park. The comprehensive plan recommended by the Commission meets both of these points by means of an additional loop in upper Manhattan connecting with the initial development and also with a second joint yard on the East River to serve the three New York railroads. This expanded system, with a line on the West Side, another on the East Side, and a third auxiliary loop on the lower East Side, makes it possible to build additional stations in territory not now served by rail, at the same time admitting the New Haven and Long Island railroads and giving all railroads equal opportunity at all stations.

The amplified plan offers the one full solution of the problem of the New York Central's West Side tracks from Spuyten Duyvil south. The plan contemplates bringing the New York Central's general-merchandise freight, perishable foodstuffs and express business along the Harlem river from Spuyten Duyvil on additional tracks to the proposed East River yard. Any other classes of New York Central's freight can then be handled either over the West Shore system or at a new waterfront yard east of the Hudson.

The additional tracks between Spuyten Duyvil and the proposed East River yard should be built as a part of the comprehensive plan, and should be available on equitable terms to all railroads of the port.

The Proposed Belt-Line Railroad System

The plan of service calls for the use of the Long Island and the New York Connecting Railroad from Bay Ridge to the Bronx by all railroads on equitable terms, and by marginal lines, not necessarily continuous but reached by float bridges or by spurs from the Bay Ridge-Hell Gate line, from which spurs are to run to Jamaica Bay and Flushing Bay. Marginal lines are to skirt the Harlem and East rivers in the Bronx from Spuyten Duyvil to Throgs Neck, and other lines are virtually to encircle Staten Island. Yonkers and the communities north are to be served by joint-car-float stations reached from Piermont. For some time to come connections between New Jersey and the Long Island belt system can be afforded by a car-float line from the Bayonne section to Bay Ridge. Running between two fixed points, with full loads at all times, such a ferry will not be expensive to operate. Ultimately, when the traffic warrants, the ferries can be replaced by a tunnel under the Upper bay.

In New Jersey the commission recommended that there be three classes of belt lines, designated as inner, middle and outer belt lines—all joined in a comprehensive and flexible whole. Nuclei for two inner belt lines already exist—one the fragmentary Brooklyn marginal railroad, the other the National Docks Railway, the New Jersey Junction Railroad and the Erie Terminals Railroad, which collectively extend along the east base of Bergen Ridge and the Palisades from Bayonne to Edgewater.

There should be one middle belt line on each side of the Hudson. The Long Island-New York Connecting Railroad and the line recommended along the Harlem River from Spuyten Duyvil to the East River will constitute the middle belt line for New York. That for New Jersey will have to be built, and should extend along the east side of the Hackensack Meadows as shown on the comprehensive plan, connecting with all of the railroads. The primary purpose of the middle belt lines is to afford a means for the direct interchange of cars between railroads and a thoroughfare for all of the railroads of the port to and from joint car-float and joint lighterage stations. Because these cars almost invariably require classification at the break-up yards, the proposed belt line in New Jersey is located wherever possible just east of those yards.

The third class of belt line, the outer belt, is at first required for New Jersey only. It should encircle the entire western half of the port, from tidewater on New York Bay to tidewater well up the Hudson River, passing outside of the break-up yards. The line as located will begin at Piermont, N. Y., on the Hudson River, pass southwesterly to the west of Paterson, N. J., and the Orange Mountains, come through the Orange range near Summit and continue in a generally easterly direction of termini on deep water, reached by short branches.

Steamship terminals will naturally be built at each of the southern termini, and a Barge Canal terminal at Piermont. A large classification yard will be required on this outer belt line, probably in the vicinity of Newark Bay, and the middle and inner belt systems should be connected with the outer belt near that yard. In a relatively short time the railroads will need to add to their break-up yard facilities, and the additions will presumably be built at the junctions of their lines with the outer belt. These additions will enable the outer belt to serve more and more as a relief to the middle belt. All of the new belt lines will open up new territory for industrial development, and should in time handle a large amount of local industrial traffic.

Consolidation of Railroad Marine Operations

Consolidation of fleets is recommended, to make it possible to operate with a much smaller total of boats at a higher load factor. Joint car-float and joint lighterage receiving stations, separated to avoid congestion, should be built at new railheads on shallow waters not suited to shipping, thereby releasing the present railhead occupancy for steamship terminal development and at the same time giving steamship companies and private terminal companies throughout the port the great advantage of receiving and delivering their railroad goods at possibly six points instead of nearly twenty.

Measures for Immediate Relief

While the automatic-electric system, the belt-line system and the joint car-float stations and lighterage stations can all be built and put into operation without interfering with present operations, several years will be required to do this. Meanwhile two steps can be taken at once to bring about partial relief in the face of the growing congestion. One of these is the consolidation of marine equipment, the other is the inauguration of "voluntary store-door delivery."

Consolidation of marine equipment need not await consolidation of terminals at any point. The advantages of a single large fleet of tugs, car floats and lighters in place of a number of independent fleets can be realized immediately.

"Voluntary store-door delivery" offers a still better opportunity for relief. Investigation has shown that probably

30 per cent of the railroad business of Manhattan is in carload lots, and a considerable amount of that of the other sections of the port is in large consignments. To avoid rehandling of the freight there should be a considerable number of detachable truck bodies with a comparatively small number of chassis, so that goods could be transferred from the car to the truck body at the transfer platform and delivered direct to the consignee. These measures for immediate relief involve no expenditures not utilized in the ultimate plan other than the construction of a few transfer platforms—for the motor-truck chassis, detachable bodies and voluntary store-door delivery should remain as auxiliaries to the automatic-electric stations.

Railway Mail Pay

WASHINGTON, D. C.

A GOOD MANY PEOPLE, in Washington and doubtless elsewhere, have been expressing some curiosity as to why, after the Interstate Commerce Commission last January announced an increase in the rates which the Post Office Department must pay the railroads for the transportation of the mails, effective on March 1, 1920, and a readjustment retroactive to November 1, 1916, the Post Office Department has not found it necessary to ask Congress for an appropriation for the money. It was estimated at the time that the increase in mail pay for the future would amount to about $35,000,000 a year, and that the retroactive payments would amount to nearly $95,000,000. Possibly some who read Postmaster General Burleson's annual report for the fiscal year ending June 30, 1920, in which he attributed part of a deficit of $17,000,000 for the year to the commission's decision, thought he had done very well under the circumstances, which perhaps is what they were intended to think. The report, however, mentioned no such large sum as had been estimated for the retroactive payments, although it did mention $14,633,607 as having been paid for the transportation of mail in prior years.

Congressman Steenerson of Minnesota is one of those who have been curious as to how the $95,000,000 has been taken care of, or if not why it has not been provided for. In a recent speech in the House he presented some evidence on the subject which indicates that unless something is done before March 4 the next Republican postmaster general is likely to have a very large deficit to account for.

It will be remembered that on July 28, 1916, Congress passed a law fixing tentative rates for the transportation of the mails, on the space basis, but directed the Interstate Commerce Commission to investigate the matter and prescribe the rates and the basis for the future, as well as a readjustment of the rates back to the date when the tentative rates were put into effect, November 1, 1916. The commission not only found the rates too low and ordered considerable increases for the period November 1, 1916, to December 31, 1917, but a further increase of 25 per cent effective January 1, 1918, because of the increased cost of operation after the government took over the roads. That meant that the increase from November 1, 1916, to December 31, 1917, would go to the railroad companies, that for the 26 months of federal control would go to the Railroad Administration, and the railroads after March 1, 1920, would be paid the new rates.

The Railroad Administration put an estimate in its January, 1920, income account of $54,000,000 for increased mail pay, which incidentally represents nearly all the net operating income which the railroads had for 1920, but when it came time for the Post Office Department to ask for its appropriation for the year ending June 30, 1921, it asked for nothing on account of the increased pay to the railroads on the ground that it had applied to the Interstate Commerce Commission for a rehearing and expected to have the rates reduced. Later it did apply for a deficiency appropriation for $8,000,000 to cover the increase for the balance of the fiscal year ending June 30, 1920, and recently it has asked for another appropriation of $35,000,000 to represent the increase for the present fiscal year ending June 30, 1921, but it has continued to say nothing publicly about any need for money to make the readjustment for the three years and four months since November 1, 1916, although at the time the $8,000,000 was asked it was suggested that the department, "at the suggestion of the Railroad Administration," had under consideration the settlement of the increased amounts due the administration during the period of government control "by a transfer of funds."

By inquiry at the Railroad Administration, Congressman Steenerson got a copy of a letter written by Postmaster General Burleson to John Barton Payne, director general of railroads, which stated that an understanding had been reached between the Post Office Department and the Railroad Administration that the approximate amount due the Railroad Administration for the 26 months from January 1, 1918, to February 29, 1920, is $65,575,832. Mr. Burleson suggested that "fiscal credit may appropriately be taken in the amount of $65,575,832.03 (should that sum be agreed upon finally) as being the balance due the Railroad Administration" and that all accounts be closed on that basis, in other words that the amount be taken care of by a book entry. In support of this suggestion Mr. Burleson quoted a statement by Chairman Good of the House appropriations committee that as the money does not go to the railroad companies it should not go to the Railroad Administration because it had already received its appropriation for all it needed. Swagar Sherley, director of the Division of Finance of the Railroad Administration, replied to this letter pointing out that the appropriation which was made to the Railroad Administration was made upon an estimate which carried as a collectible asset the moneys due it from the various departments and that the other departments had obtained appropriations from Congress and settled in cash. He suggested that the Post Office Department should make its own request for a deficiency appropriation. He also added that the Railroad Administration had also estimated that some $4,000,000 was due it from the Post Office for side and terminal service, in addition to the $65,000,000, but that the amount had not yet been agreed to by the Post Office Department. Congressman Steenerson also read another letter from E. M. Alvord, assistant to the director general, dated December 30, 1920, saying that Chairman Good had misunderstood the situation and that the Railroad Administration appropriation was estimated on the assumption that the Post Office would ask for the $65,000,000 as a deficiency appropriation and pay it to the Railroad Administration as has been done by the War Department in similar cases. "If the Post Office Department does not ask for this appropriation and pay the Railroad Administration," he said. "then the latter will probably be compelled at some time in the future to ask for additional appropriations to cover that amount."

Mr. Sherley's letter had suggested that the dispute as to the amount for side and terminal service be settled before asking for the appropriation, but the expiration of the present Congress is only about a month away and the request for the appropriation has not yet been made. Mr. Steenerson also said that the testimony of the Post Office Department officials showed that a sum of $16,000,000 had been settled upon as due the railroad companies for the period from November 1, 1916, to December 31, 1917, and that it had been stated a deficiency appropriation would be asked for that amount. Whether this sum has yet been paid to the railroads does not clearly appear, but at any rate there has been no appropriation for it nor for the $69,000,000 due the Railroad Administration.

Is the Railroad Problem Really Being Solved?*

Reduction of Expenses to Enable Net Earnings of Six Per Cent Requires Readjustment of Wage Scales

By Samuel O. Dunn
Editor of the *Railway Age*

At least once in each year every well managed business concern takes an inventory. It does so to find out exactly what stocks it has on hand and what is its financial position. Inventories have been very important this year. Most of the business concerns of this country which recently have taken them have found that their stocks of goods have greatly depreciated in value and that their financial position has changed greatly for the worse since a year ago.

It is almost a year since the railways were returned to private operation. Many changes have occurred since then. It is time that a comprehensive inventory should be taken to find out whether as a result of these changes the situation of the railroads has been made better or worse. I do not mean by this merely an inventory of the stocks in the storehouses. The business condition of a merchant is determined largely by what his inventory shows regarding the amount and value of the stocks of goods he has on hand. An inventory of the railroads to determine what their situation is involves the taking of stock regarding many things, including the condition of their physical properties, the morale of their officers and employees, their present and prospective traffic, their present and prospective earnings and expenses, the regulation to which they are subjected and the attitude of the public and public men towards them.

It would be impossible in a short address to take stock regarding all these matters. It is, however, possible to present briefly certain important concrete facts relative to them and to draw the conclusions suggested by these facts. If the facts are truly stated and the conclusions drawn are correct some light will be thrown on the question whether any progress is being made in solving the railroad problem.

Present Situation Shows Many Improvements

A partial statement of developments within the last year could be made which would imply that the present situation and future prospects of the railways are very happy. They have been returned to private operation. The physical condition of the properties has been substantially improved. The morale and efficiency of the organizations have been somewhat bettered. The efficiency with which locomotives, cars and other facilities are used has been increased, and it has been shown that the carriers can handle more traffic than ever before. Legislation has been enacted requiring the Interstate Commerce Commission in regulating rates to give due consideration to the country's need for the adequate development of its transportation facilities, and to let the railways earn for two years an average return of 5½ or 6 per cent, and subsequently such return, assuming economical management, as they may need to provide adequate service. Under this legislation the Interstate Commerce Commission has authorized the fixing of rates which it estimated would yield a return of 6 per cent on a valuation of $18,900,000,000. A Railroad Labor Board has been established to which all controversies arising between the railways and their employees which might lead to an interruption of transportation must be referred. The Board is authorized to determine reasonable wages, giving due consideration to the cost of living, conditions of employment and other pertinent matters, and it has awarded the largest advance in wages ever made at one time to the obvious satisfaction of railway employees.

Situation Worse Than Ever in Other Respects

Surely these developments indicate that the railroad problem is being solved. And yet it is no exaggeration to say that seldom has the railroad situation been worse in many respects than now. Several months ago the railway executives started to reduce the number of freight cars in bad order to 4 per cent of the total, but it still exceeds 7 per cent. They started to put their locomotives in good condition, but an ominously large part of them are still in bad condition. One of the principal causes of the unpopularity of government operation was that under it a large deficit was incurred which had to be paid from taxes. During the first six months of private operation, when the government's guarantees of net return to the companies were continued, a further large deficit was incurred which the taxpayers must pay, and which has not tended to heighten the popularity of private operation. The government still owes the companies about $400,000,000 on account of this deficit, no part of which apparently will be promptly paid to them unless special legislation is enacted by Congress. The inability of the companies to get this money has caused them to accumulate a vast current liability to concerns from which they have bought equipment and materials and has brought many railways face to face with a very acute financial situation.

Roads Not Earning Six Per Cent

To have put their net operating income on an annual basis of 6 per cent on their valuation the railways should have earned in September $109,220,000, in October $112,709,000 and in November $99,598,000, a total of $321,000,000. The net operating income actually earned in these months was: September $75,310,000, October $86,456,000, and November $57,741,000, a total of only $219,507,000, or but 67 per cent of the return expected. At this rate the railways would earn only 4 per cent annually on their valuation, instead of 6 per cent, and these were months of large business. Their freight traffic has declined 30 per cent since October, and on January 1, instead of a large shortage of cars, such as had prevailed so long, they had a net surplus of 257,000 cars.

It was claimed that the advances in rates granted by the Interstate Commerce Commission would cause an increase in prices and in the cost of living. They were speedily followed, however, by unprecedented general declines in prices, and in spite of the fact that the new rates are not yielding to the railways anywhere near the net return expected loud complaints regarding them have begun to be made, especially by farmers and other classes of persons who are suffering from the declines in prices which have occurred. Therefore, although the railways in 1920 handled a record-breaking business with an efficiency which in many respects was unprecedented, and although the advances in rates did not

*A paper read before the meeting of the New York Railroad Club on January 21.

cause any increase in the cost of living, it is obvious to every student of public opinion that, because of the large deficit incurred before the advance in rates was made, and because of the large advances in freight and passenger rates granted private management of railroads is not as popular in this country now as it was a year ago. Perhaps it is largely due to this that the spokesmen of the railroad labor brotherhoods have considered the present an opportune time to send broadcast wholesale charges of mismanagement and waste against the railway companies in connection with repairs made to locomotives and cars outside of their own shops.

Difficult to Reach Conclusion That Problem Is Really Being Solved

When one surveys and weighs facts such as these I have just mentioned he is likely to have difficulty in reaching the conclusion that the railway problem is really being solved at the present time.

If we regard the situation from the standpoint merely of the legislation which has been enacted we are likely to draw conclusions which are too optimistic. Legislation and the decisions and orders of regulating bodies are mere "scraps of paper" until they have actually been given effect.

On the other hand, if we consider only the poor showing of earnings that the railroads have made under the new rates, the enormous decline of traffic which has recently occurred, the attacks upon the railway companies which have been made by spokesmen of the labor brotherhoods, and the slight but easily perceptible and unfavorable change in public opinion which has occurred, we shall draw conclusions that are too pessimistic.

The railroad problem was acute before this country entered the war. Our participation in the war and government operation caused many important developments affecting the railroads adversely which greatly increased the difficulty of the problem. They made it a problem of tremendous complexity and difficulty. Therefore, there is no occasion for great surprise and disappointment because the final solution of it is still far off. It cannot be solved unless the public and public men can be made to understand what the problem is at present and why it is what it is. Therefore, it is our duty not to repine or grumble because faster progress has not been made, but to state the problem and its causes clearly over and over again until the public and public men do understand it and its causes. It does not seem unreasonable to believe that once they have got a correct understanding of it and its cause they will act fairly and wisely.

I need hardly recall to you that even before we entered the war the development of the railroads had been practically stopped by adverse regulation and that they had become unable even then to handle satisfactorily the commerce of the country. In the years 1914 and 1915 the average net return earned by them had declined to only about 4 per cent on their property investment. Suddenly, late in 1915, there came a great increase of traffic with the result that for about a year and a half before we entered the war there were constant congestions and shortages of cars. In the years 1916 and 1917 earnings were very large and the companies made unprecedented expenditures for maintenance. In consequence when at the end of 1917 government control was adopted the companies turned over to the government a plant which, while it was inadequate to the demands of business, was probably in the best condition it ever was.

President Wilson's Proclamation

It was a momentous event in the history of the railroads and in the history of the country when on December 26, 1917, President Wilson issued his proclamation announcing the adoption of government control. It is important to recall what the President said at that time because it has a direct and important bearing on subsequent developments and the present situation. The President said:

> Investors in railway securities may rest assured that their rights and interests will be as scrupulously looked after by the government as they could be by the directors of the several railway systems. Immediately upon the assembling of Congress I shall recommend that these definite guarantees be given:
>
> *First*—Of course that the railway properties will be maintained during the period of federal control in as good repair and as complete equipment as when taken over by the government.
>
> *Second*—That the railroads shall receive a net operating income equal in each case to the average net operating income of the three years preceding June 30, 1917, and I am entirely confident that the Congress will be disposed in this case as in others to see that justice is done and full security assured to the owners and creditors of the great systems which the government must now use under its own direction or else suffer serious embarrassment.

Solemn Obligation to Railroad Owners Not Kept

There can be no doubt that President Wilson desired and intended that the solemn obligation to the owners of the railroads, to which he committed the government under powers vested in him by Congress, should be kept. He recommended and Congress passed legislation designed and appropriate to fulfilling these obligations. It is, however, susceptible of proof that this solemn obligation on the part of the government has not up to the present time been fulfilled, and it is largely because it has not been fulfilled that our railroad problem is what it is today. The government did not "maintain the railroads in as good repair and as complete equipment as when taken over." For example, it did not put in their tracks anywhere near the number of new ties and rails necessary to maintain them in accordance with its obligation. Even in the year 1919, after the war was over, it placed in their tracks the smallest number of tons of new rail that had been laid for 22 years. It bought in the 26 months of government control only as many freight cars as the companies had actually scrapped and retired from service annually during the preceding five years. It bought no passenger cars at all. It repaired and maintained their locomotives and cars so inadequately that when the railways were returned to private operation their equipment was in the worst condition ever known.

Nor did the government keep its promise to investors in railway securities that "Their rights and interests would be as scrupulously looked after by the government as they could be by the directors of the several railway systems." The year before the government took over the railroads they earned a net operating income of $975,000,000. To have fulfilled its obligations to investors the government should not only have guaranteed to them the same return as had been earned in the three years ending June 30, 1917, but it should have returned their properties with the same relationship existing between earnings and expenses as existed when they were taken. On the contrary, enormous increases in expenses occurred, corresponding advances in rates were not made, and when the properties were handed back the net operating income had been absolutely wiped out. The complete destruction of the net operating income had caused a decline in the value of railway securities which meant a loss of billions of dollars to those who held them.

In Striking Contrast to Other Industries

While the government did not adequately maintain the properties as it had obligated itself to do, it did pay war prices which, of course, were unprecedently high prices, for all the additional facilities it provided. Many of these additional facilities were provided to further the Director General's scheme of permanently "unifying" all the railroads—a plan absolutely inconsistent with the obligations to the

owners of the properties into which President Wilson had solemnly entered on behalf of the government. Since government control was a war measure, and since many of the capital expenditures made under it were made to carry out a scheme of unification to which the owners of the railways had never consented and to which they were opposed, it would have been only fair for the government to have assumed and written off as one of the costs of the war a large part of the capital expenditures it made, just as it assumed a large part of the capital expenditures made in many other industries for war purposes. On the contrary, the Railroad Administration has sought throughout to compel the railway companies to assume the entire burden of all this class of war expenditures and to add them to their capital accounts, on which a return must be earned and paid in perpetuity.

The government's treatment of the railroads in these respects is in striking contrast to its treatment of other industries. Whatever else may be said of government control, it cannot be said that under it the railways failed to render the service for which they were taken. They handled every soldier and every ton of freight for which transportation was needed in order to win the war.

No "Railroad Millionaires"

The government, however, paid to the railway companies for the use of their properties a rental equal only to the returns they had earned before the war. There was no profiteering by the railways. The war made no "Railroad Millionaires."

In the coal industry, on the other hand, the government fixed prices which enabled producers and dealers to make profits surpassing the wildest dreams they had ever had.

It spent hundreds of millions of dollars for aeroplanes which never flew. Those who made these aeroplanes derived large profits from making them, and they have got their money.

It spent hundreds of millions of dollars for ordnance which never fired a shot. Those who made this ordnance derived large profits from making it, and they have got their money.

It spent hundreds of millions of dollars for millions of tons of shipping which never carried a pound of freight during the war. Those who built these ships made large profits, and they have got their money.

Deficit in First Six Months of 1920 an Aftermath of Government Control

The railroads, as I have said, rendered all the service for which they were taken and their owners during government control and during the first six months of private operation following government control were guaranteed only the same return that actually had been earned during the three years before the war; and yet today the government owes their owners $400,000,000 which is almost five months overdue. The companies are in dire need of this money, and yet the Treasury Department and one federal court have held that no railway company can get any part of its share of what remains due it until it has made a complete settlement with the government, which in most cases will take months. It may be said in extenuation of the government's course in delaying payment of this part of its indebtedness to the railways that it was not incurred under government control but is due to a deficit incurred under private operation. That is true, but it is easily demonstrated that the deficit incurred in the first six months of private operation was the direct aftermath of government control. It was due to the following facts:

First—Under government control the net operating income of the companies was wiped out by increases in expenses.

Second—The government failed to make the advances in rates which were needed to restore the net operating income to its former basis.

Third—The government did not adequately maintain the properties, which rendered it necessary for the companies after the railways were returned to them largely to increase maintenance expenditures. It was this condition which forced them to give large amounts of repair work to outside plants.

Fourth—The Railroad Administration left pending huge demands for advances in wages, which a government body, the Railroad Labor Board, met by awarding advances amounting to $620,000,000 a year.

These things made it inevitable that unless a large advance in rates was granted by the Interstate Commerce Commission immediately after the railways were returned to private operation a huge deficit would be incurred, and no advance in rates was granted until after six months of private operation.

A Breach of Faith to Withhold Payments of Guarantee

The government in the exercise of its war powers treated other essential industries not only fairly but generously. The railways, one of the most essential of all industries, it did not treat generously or even fairly during the war and it is now adding another wrong and injury to those it already has done them by withholding from them the large amount of money due them. It would be another breach of faith on its part for it to continue to withhold this money any longer than is absolutely necessary.

If this money should be paid to the companies in the near future it would relieve their present pressing necessities. It would also relieve the pressing necessities of the many concerns to which they owe many millions of dollars. It would enable the railways to begin making the larger purchases which they ought to make to put their facilities in better condition. But while it would relieve the present situation it would not by any means solve the acute railroad problem now confronting us.

Net Returns Not Sufficient Under New Rates

The Interstate Commerce Commission has recognized the principle that the railways must earn 6 per cent on a valuation of $18,900,000,000 to enable them to raise enough capital to expand their facilities sufficiently to give the public adequate service. The commission and most other students of the subject believed that the advances in freight and passenger rates granted about five months ago would enable the railways to earn 6 per cent. The time has come when we should squarely face the manifest fact that the railways cannot with existing rates and existing wages and other costs earn 6 per cent. As I have shown, they earned at the rate of only 4 per cent in the months of September, October and November, when they handled more business than ever before in those months. Their failure to earn the return expected is partly due to the fact that in many states advances have not been made in state rates corresponding to those made in interstate rates. But, it is evident that even if all rates were advanced as much as the Interstate Commerce Commission held was necessary the railways could not earn the return estimated by the commission. The commission recognized, however, that if they did not earn 6 per cent they could not raise the capital required adequately to enlarge their facilities. If they cannot do this they cannot provide good and sufficient service for the public. We should not allow ourselves to be in the least deceived by the fact that the demands of traffic are at present not equal to the capacity of the railways. We have had many commercial depressions and declines of traffic before, and they have always been followed by periods of industrial and commercial activity in which the traffic offered has exceeded

anything ever known before. We shall see history repeat itself in this respect.

Reduction of Expenses Only Alternative

The net operating income of the railways can be made sufficient by further advancing their rates or by reducing their expenses. Undoubtedly the public would strongly oppose a further advance in rates under present conditions, when the prices of most commodities, especially of farm products, are declining. The only alternative is to reduce operating expenses. The large items of operating expense are roughly divisible into three classes—cost of fuel, cost of material and supplies, and cost of labor. Prices of fuel and of materials and supplies have been extremely high, but developments are occurring which are reducing them and undoubtedly should and will reduce them further in a short time. The present very high operating expenses of the railroads are, however, chiefly due to their enormous payroll. This enormous payroll is due to the granting of the eight-hour day under government control, which has caused a large increase in the number of employees; to the fact that the efficiency of labor is much lower than before the war; and to the large advances in wages made by the Railroad Administration and by the Railroad Labor Board last July. The operating expenses of the railways are now running at the rate of about $5,950,000,000 a year, or over $3,100,000,000 a year more than in 1917. Of this increase in expenses since 1917 almost $2,000,000,000 is due to increases in the payroll.

Reduction of Payroll Necessary for Reduction of Expenses

It seems evident that no sufficient reduction of expenses can be secured without a reduction of the payroll.

The advance of $620,000,000 a year in wages awarded last July by the Railroad Labor Board was made when the cost of living was the highest ever known, being 104.5 per cent more than in 1914. Since then the cost of living has declined, and is estimated by the National Industrial Conference Board to be now only 90 per cent more than in 1914. The present annual average wage of railroad employees for working eight hours a day is 125 per cent greater than it was in 1914 for working ten hours a day. The employees have benefited both by a substantial reduction in their working hours and by large advances in their average wages, and under the national agreements made by the Director General of Railroads with various organizations of employees many millions of dollars are being paid them annually for work that is not done. In 1914 the railways had 1,700,000 employees and paid them $1,337,000,000. In 1917, although they handled a very much larger traffic, they had about the same number of employees and paid them $1,740,000,000. Today, because of the establishment of the eight-hour day and the advances in wages which have been granted they have about 1,950,000 employees who are being paid about $3,600,000,000 a year. While the increase in the average annual wage per employee since 1914 has been about 125 per cent, the increase in the total payroll has been about 170 per cent.

The Attitude of Farmers and Business Men

The farmers and business men of the country recently have lost many hundreds of millions of dollars because of declines in prices. Wages already have been reduced in many industries. The Railroad Labor Board in granting the advance in wages last July based it largely upon the high cost of living prevailing at that time. No injustice would be done railway employees by making some reduction of their wages at this time. In view of developments since the present wages were fixed a rehearing of the wage case should be held and wages fixed which will be more in harmony with existing conditions.

As I have already remarked there is much complaint from many sources regarding the present freight and passenger rates. The necessity for the present rates is created chiefly by present wages and unless there is a great increase in the efficiency of railway employees, which their organizations are not only not trying to promote but by opposing piece work and other efficiency methods are actually trying to prevent, either wages must be reduced or freight and passenger rates must be further advanced. The farmers, shippers and consumers are all deeply interested in the question of railroad costs because the cost is what makes the rates which all the public have to pay directly or indirectly, and the railway payroll at present constitutes 60 per cent of all operating expenses. All present railway costs should be reduced, but the payroll is so large a part of total operating expenses that no substantial relief to the railways, which are not earning an adequate net return, or to the public, which has to pay present freight and passenger rates, probably can be obtained without a substantial reduction in wages.

With Care and Discrimination

Any reduction in wages which is made should be made with care and discrimination. It should be made with due regard to the cost of living and to the value of the service actually rendered by different classes of employees. It should recognize the fact that most supervisory officers were paid too little as compared with most classes of employees before the recent advances were made and that the advances granted to them have been relatively less than those given to the employees. Therefore, it is very doubtful if any reduction in the compensation of supervisory officers should be made. Account should be taken of the fact that many unfair relations between the wages of different classes of employees exist and that therefore while some classes of employees could in fairness have their wages sharply reduced some other classes, such as section foremen and signalmen, should have theirs reduced much less, if at all. But, it has become manifest that the railroad payroll, in the aggregate, should and must be substantially reduced, and steps in this direction should be taken in the near future.

Inability to Earn Proper Return Creates a Serious Situation

The demonstrated inability of the railways to earn the return provided by the Transportation Act, even when handling a maximum traffic, and the tremendous decline of traffic which has occurred, are creating a serious situation to which not only railway managers, but business men, the Railroad Labor Board and the Interstate Commerce Commission and Congress should give early attention.

The return of the railways to their owners was made in obedience to a public sentiment which unmistakably favored private ownership and management. The passage of the Transportation Act was a long step toward the solution of the railroad problem under private ownership and public regulation, provided it is to be treated not merely as a "scrap of paper," but is to be carried out in the spirit of a constructive measure designed and intended to enable the railways to be rehabilitated and expanded to meet the social, commercial and industrial needs of the country. Because it has not yet produced all the beneficent results which its advocates and authors expected is no reason for saying that it is not adapted to solving the railroad problem.

But neither it nor any other piece of legislation, however skillfully designed and constructed, will accomplish its purpose unless it is fully carried out in the spirit in which it is drafted and enacted.

The Transportation Act imposes upon the managers of the railways the duty of operating and developing them as economically and as efficiently as they can. It imposes upon the Railroad Labor Board, in case of a controversy between the companies and the employees that may interrupt transportation, the duty of establishing working conditions and wages which will be fair to the employees, but which at the same time will be such that the companies can operate and develop the properties efficiently and economically. It imposes upon the Interstate Commerce Commission the duty of seeing that the railways are efficiently and economically managed and developed, and of fixing rates which will be fair to the public, but which at the same time will be sufficient to enable the railways to provide adequate service.

The failure of the government thus far to make good on its guarantee of standard return during the first six months of private operation has created an extremely embarrassing and critical situation, but the good faith of the government is pledged to remedy this condition promptly, and doubtless it will do so. The railway managers, the Railroad Labor Board and the Interstate Commerce Commission thus far undoubtedly have tried to meet the obligations and perform the duties imposed upon them by the Transportation Act. That their united efforts have thus far failed to advance the solution of the railroad problem as much as was hoped is due mainly to the complexity and difficulty of the problem and to conditions beyond their control. The complexity and difficulty of the problem are still as great as ever, but today the problem should be better understood by those who are wrestling with it than it was a year ago.

We do not know as yet whether it is really being solved, but we soon shall know. We shall soon know whether the railway managers, the Railroad Labor Board, the Interstate Commerce Commission and Congress have the intelligence, the ability and the courage squarely to face the facts, and to do the things in their several spheres which the facts clearly indicate they must do if the plain spirit and intent of the provisions of the Transportation Act regarding the wages and conditions of work of the employees, the regulation of rates and the development of the facilities of the railways are to be carried out. If the plain spirit and intent of the provisions of the Transportation Act regarding all these matters are carried out, I have no doubt we shall be able to decide that the railroad problem is being solved.

The Service of Supply as a Business Institution*

Conservation of Material by Application of Business Principles Is Essential to the Railroads

By H. C. Pearce
General Purchasing Agent, Seaboard Air Line

THE REAL PURPOSE of the service of supply is to provide needed materials for the economical maintenance and operation of the railroad, where they are wanted, of the most suitable quality for the purpose for which they are required, and at the lowest net cost to the railroad. The supply officer is charged with the responsibility of expending monies for materials and supplies for the railroad as carefully as he would for a mercantile establishment, with this difference, a merchant buys to sell, the supply officer buys to use.

Principles of Organization

The first underlying principle of an organization to carry out the real purpose of the service of supply is the means of knowing accurately, at all times, that the need exists, what the resources are to meet the demands, and the monies available. It will be admitted without question, that every organization must have one directing mind to co-ordinate the different elements which must enter into a department of a railroad. There is undeniably an inseparable connection between the officer that procures the material and the officer that distributes and accounts for it.

An organization is not so much a matter of titles as of purpose and the understanding of its responsibilities. An organization must be built for the purpose, and not to fit around the individual. The ideal supply organization would have as its head a chief supply officer, with whatever title conditions and individual opinions may determine. This officer should have entire charge of the service of supply, and as many officers reporting to him as the extent of the property may require. Broadly speaking the organization would consist of a chief supply officer, purchasing agent, general storekeeper, tie and timber agent, fuel agent, engineer of tests, supply train storekeeper, district division and local storekeepers. It will be apparent that under this broad plan of organization there are many properties where the purchasing agent, general storekeeper or storekeeper can assume the duties of chief supply officer and carry out the full purpose of the organization.

Policies Governing Purchases

Many splendid businesses have been wrecked by injudicious buying; the difference between a purchase and an order means the difference between success and failure, and when we consider the enormous sums of money which our railways expend annually, it must be apparent that next to the need, the expenditures of these monies is of primary importance.

Materials should be arranged for before they are needed, for obvious reasons. I am a strong believer in the plan, known generally as the "Thorne" system, introduced by the late W. V. S. Thorne, and carried out most successfully on the Harriman lines. The plan is simple; the first requirement being to definitely determine what is the most desirable material to purchase, based on service, source of supply and price. This having been definitely determined, a "running agreement" is made for the requirements, subject to cancellation by either party giving 30, 60 or 90 days' notice. This ensures a fixed source of supply, a quality of material that is best suited for the requirement, and enables the manufacturer to produce it at the lowest cost. It eliminates the expense and delay incidental to the sending out of inquiries, receiving proposals, tabulating bids, etc. Each day's delay between the time the need develops and the delivery is made represents a loss, either in interest on capital (as stock must be maintained to provide for all lost motion)

*From an address on "The Service of Supply" delivered before the New England Railroad Club on January 11.

or a loss through lack of delivery, due to the time used in negotiating the purchase. The purchasing agent must be responsible for deliveries of materials to the railroads, and this is a very important factor in determining the inseparable connection between the procuring and the disbursement officers.

One of the very important duties of the purchasing agent, and one which is not nearly as well understood as it should be, is the disposition of salvage, not merely of scrap, but of all second hand, obsolete and unneeded materials and equipment that is acquired for any reason. The experience and acquaintance of the purchasing agent together with the machinery of his office, should be utilized by the management of our railroads to the fullest extent in the sale of all unneeded materials, tools and equipment.

Specifications Are Vital

Broadly speaking, all material should be bought to specifications. I know it will be contended that this is not always practical. Manufacturers' agents who wish to sell some special brand, or mechanics and others who prefer to criticize the quality of something, rather than write a specification, will not approve the plan. Our technical officers should be able and should be required to put all their knowledge of what is required into a specification. Three factors should be taken into consideration in preparing a specification—(a) the service required, (b) the source of supply, (c) the cost. If representatives of each of these factors, i. e., the user, the manufacturer and the buyer, were consulted in their preparation, more than 90 per cent of the materials used on our railroads could be covered by practical and economical specifications.

Specifications without tests are worthless; and how is any buyer to know what he is getting unless the material he received is tested, and how can it be tested unless it is built to a specification? It is the only practical plan either for the manufacturer or buyer. It is to be hoped that the minimum specifications will be adopted by the American Railway Association. With minimum specifications the manufacturers have a base to work to; any railroads or service requiring something better than the minimum specification can procure it at the lowest cost, because there is a base to work to. It is the only way to obtain honest and necessary competition. Because railroads have not followed generally the plan of buying material to specifications in competition, is one of the principal reasons why we have been saddled with Section 10 of the Clayton anti-trust act.

The engineer of tests should report to the chief supply officer, for the reason that it is desirable that materials should be arranged for in advance of the need. The engineer of tests on our railroads should be investigating, developing and reporting on the requirements, source of supply, conditions, and facilities of manufacturers at all times; if this were done, as it should be, there would be very little inspection required at destination, and none of the long, tedious and expensive delays due to receiving material that fails to conform to the specifications being held up and determined upon by long and many times useless correspondence.

It will be said that the engineer of tests should either be an independent department, or report to the using departments, on the ground that they are responsible for the kind of material that is used. My answer to this statement is that the using departments are responsible for the specifications, and the supply department is responsible for furnishing material to the specifications.

The Distribution of Materials

The distribution of materials to the users is easily one of the most important functions of the service of supply. Material has no value, either to the railway company as capital, or to the using departments as service, until it reaches the points where it is needed to be used. It is essential, therefore, to determine upon methods which will best enable the railway company to conserve its assets and make them available where wanted in the least possible time. Material must be first assembled and maintained at as few points as possible for distribution, for the reason that it represents money which must be as closely guarded and conserved as if it were in the bank. The desirability of this practice is based principally upon the following facts:

(1) Generally there is only one place on a railroad where there is sufficient organization for the thorough inspection, test, check and care of materials.

(2) That materials can be inventoried, guarded, cared for and disposed of, if necessary, more readily where centralized.

(3) By restricting the number of places where stock is carried, a smaller fixed investment will be found sufficient to adequately protect the general needs of all departments.

The shops, representing the largest users of classes, if not values of materials, must first be considered and a practical plan is for the stores department to deliver material to the users in the shops. This keeps high priced mechanics at their work and their machines in operation during a period which otherwise would cause them to be absent securing needed materials and it enables the supervising forces to keep in touch with the progress of the work and the actual needs of the mechanics.

The shop delivery system assures accuracy in accounting by requiring that all material orders be revised and the proper description entered thereon by the store delivery supervisor before they are delivered to the office. It provides the means for obtaining a material order for all material issued; it enables the store department employees to observe the use of material by coming in personal touch with the men who are actually using it, and it provides a method by which they can intelligently anticipate and provide for the needs and satisfy themselves that the material will be utilized as intended. Moreover, it results in delivering material to points required in less time than other systems now in effect and at less expense. It also ensures an opportunity for locating and returning to stock, materials drawn for use and not applied; it ensures proper supervision over the manufacture of materials and the return of the finished or repaired product to the stores when completed. It encourages the use of serviceable second hand and repaired material in lieu of new and, by co-operation, provides for the disposition of shop worn material in proper sequence, thus avoiding the inadvertent disarrangement of stock.

Merits of the Shop Delivery Plan

The plan is very simple; it merely consists in establishing certain stations in the shops and grounds where material requisitions are received and materials delivered; usually a box marked in some specific manner, with a small shelf. These stations should, of course, be located as conveniently to the work as circumstances and conditions will permit. Material requisitions are prepared by the man who wishes to use the material, and either signed by him or by the foreman, as may be determined by the using departments. They are placed in the box and the material is delivered where directed by the delivery forces. The force consists of a store delivery foreman and as many men and boys as are necessary to give prompt and efficient service, which, of course, must be measured by the location of the material, facilities for delivery, distances, volume of work, etc.

The piece work basis for the delivery of material is not satisfactory, for the reason that it places a premium on getting material out of the store, whereas the object should

be to deliver only what is actually needed and to return whatever is not needed for any reason. As the mechanic and deliveryman should work together with the object of utilizing what is available by substitution and otherwise, this requires both intelligent and close co-operation between the section storekeeper and the mechanic.

The saving which can be made by applying this plan to its fullest degree of usefulness is obvious, and by improving the system by the introduction of automobile trucks and trailers, under an intelligent dispatching and supervising system, the cost of delivering materials can be tremendously reduced. But the real merit of the plan is not in the actual difference in the cost of delivering material; it rests upon the fundamental fact that the storekeeper must have some means of knowing accurately, at all times, what is needed, that nothing is available that can be used, that the material furnished is giving the best service, that the demands are met, and that nothing is wasted. The store delivery system is a link in the service of supply, and is based on the theory that supply officers must know what is needed before they invest the railway company's money.

Origin and Purpose of the Supply Train

The supply train serves the same purpose for the line that the store delivery does for the shops, and in precisely the same way. It places the representatives of the stores department in personal connection with the users on the line; it places the storehouse at the disposal of the men on the line that use the material; it establishes the closest relations between the two, which, when coupled with a thorough inspection by the supervisory officers, as it should, furnishes the ideal method of distributing material on the line.

The supply train is the outgrowth of the supply car, it is the only economical and systematic method of distributing supplies to sections, agencies, signal towers, etc. A supply train should make about one freight division of 110 miles in 8 hours; it offers the only practical and economical method of making a thorough inspection of all the smaller stations and junction points; it is the only way that division officers can come into personal contact regularly with such officers as agents, signal maintainers, section foremen, etc. The average cost of delivery, based on the issues, is 11 per cent, but service of this kind cannot be measured by costs; its economy consists in providing a plan whereby all outside points may be reached at regular intervals, and the actual demands determined and cared for. The supply train affords a systematic means of keeping the road clean of surplus, obsolete and scrap materials; it offers the only means by which general and division officers can and will make a thorough inspection and come in personal contact with agents, section foremen, signal maintainers, etc.

The reason why the supply train has not been generally adopted on our railroads is due to the fact that there has not been a sufficiently broad conception of what the service of supply should embrace. The supply, or what is commonly known as the stores department, has been looked upon as merely the depot where supplies should be procured when ordered by the users, and the storekeeper in charge merely as the man who hands them out over the counter. It has occurred to few that the service of supply must be based on broad enough lines so that its agents should know what is actually needed; what gives the best service for the purpose, and have means at their disposal whereby they can come in personal contact with the users on the ground. The supply department is responsible not merely for having materials, but also the quantity and quality, and must also dispose and market the salvage.

A supply train may consist of from 15 to 30 cars, according to the size and location of the division. The train is made up of an office, dining and cook car, where the supply train crew lives and does its work and where the train crew eats; a stationery car fitted up with compartments for each standard form used, with drawers and apartments for all other stationery supplies; a miscellaneous supply car with station, operators and signal supplies; a bulk car for package and extra supplies, a tool car for track tools; an oil car with tanks sufficient to take care of the requirements of lubricating and illuminating oils; one or more tank cars with gasoline; one or more cars with frogs, switches, spikes, bolts, etc., one car for trucks, wheel barrows, and material of this character, and as many other side boarded flats as may be necessary to take care of the serviceable second hand and scrap materials picked up.

How the Supply Train Operates

The crew should consist of a supply train storekeeper, in entire charge, except of the movement of the train, which is, of course, in charge of the conductor; about three assistants, one in charge of miscellaneous supplies, one in charge of stationery and one in charge of track tools and roadway materials. The train moves on a schedule, prepared at least a month in advance by the superintendent and general storekeeper. While the purpose is to change the schedule as little as possible, it is necessary to change it at different seasons of the year, in order to take advantage of traffic conditions by using light power.

Everything is prepared between stations, that is, requisitions for agent's supplies are checked and the material got ready to deliver; stationery is got out in the same manner, oil cans filled and everything made ready to issue promptly when the train stops. The supply train storekeeper and the conductor know the location of each station and where the stops will be made. Usually the first stop is made with the miscellaneous supply car, tool car and track material opposite the tool house. The man in charge of the miscellaneous supply car with the section foreman, delivers the tools and supplies required; at the same time the stationery clerk is delivering the stationery, the man in charge of the oil car is delivering the oils and drawing off the gasoline. The section crew is unloading frogs, switches and other heavy material; exchange tools for repairs are checked and delivered into the tool car; surplus, second hand and scrap material is loaded and classified; stationery is checked and such as is required delivered, whatever is on hand that should not be for any reason, is taken up and returned. In the meantime a thorough inspection is being made of all station buildings and grounds by the superintendent, division engineer and division storekeeper; investigations are made on the ground regarding the service of tools and supplies; if additional supplies are needed that are not called for by the requisition, they are delivered and the requisition approved by the ranking officer on the ground. Items not needed are eliminated. A memorandum has been prepared in advance by the section foreman of second hand tools requiring repairs. The weight of the different classes of scrap is estimated, receipts exchanged, and the work completed on the ground. It is astonishing how quickly all this work can be accomplished when properly organized.

Distribution Through Division Stores

Generally speaking, material can be moved from the general to division stores in car loads on sailing dates or schedules; that is, there should be a specific time each month for the requisitions to come to the general store, they are made up in sections, the cars are marked as per schedule, loaded and shipped on regular dates. In a well organized general store, requisitions for material on hand should be shipped in not to exceed 24 hours from the time they are received. Deliveries to local stores, round houses, junction points, etc., should be made from the division stores via

local freights and be directed and controlled by the division storekeeper.

Materials should preferably be moved in car loads in through freight trains, but recognizing the need of having fast service, it is recommended that a certain number of baggage cars be assigned, operating between the general store and the various division stores; where baggage cars for this service are not available, then baggage cars on the regular trains can be used, but special service is recommended.

The principal inspection points and terminals should be provided for through the division stores, although there are many railroads where this is not practical, and provision can be made from the general store. The reason why it is more desirable to protect these points through the division stores is that the division storekeeper is and should be in closer touch with the division officers.

A Broad Conception of Reclamation

Reclamation in its broadest sense has been largely misrepresented and misunderstood. Reclamation means the reclaiming or making useful that which has been discarded. The reclamation of material on a large and systematic scale by the supply department was first introduced by the Santa Fe about 10 years ago. The fundamental principle underlying reclamation is that nothing must be reclaimed that will not be needed for future use or that cannot be reclaimed at a saving, and in order to guard against losses or incorrect conclusions, an accurate record must be kept covering each operation, from which a monthly statement should be compiled showing the net results (savings or loss) on each item of material reclaimed.

The salvage department on a railroad should be organized for the purpose of salvaging discarded and worn out material of all kinds, including equipment. This department should be in direct charge of the general storekeeper, reporting to the chief supply officer; this is based on the principle that the chief supply officer is responsible for providing suitable materials at the lowest net cost, and must have at his command an organization capable of following material from the time it is ordered until it is salvaged and disposed of.

There is one feature of this work which operating and maintenance officers seem to lose sight of, and that is that the supply department is not taking over any of the functions of the maintenance department in salvaging materials, they are taking over this work after the using departments have finished with it. The using departments are expected and should be required to get the utmost service out of their materials and tools, and not permit them to be turned over as scrap to be salvaged until they have performed their full service. Materials which cannot be recovered, reclaimed, or repaired must then be classified into what is commonly known as scrap, according to the official classification, for the purpose of obtaining the highest market prices. The following outstanding features of this work must appeal to all practical men:

(1) That the supply department is organized for the purpose of supplying materials, and the reclaiming of materials is one of its sources of supply.

(2) That the work of dismantling, disposing, and sale of all materials, including released equipment, is one of the duties of the supply department.

(3) That this work can be done more economically in conjunction with the handling and marketing of scrap, of which it is a part.

Very great savings can be effected on our railroads by organizing and operating a large well equipped reclamation plant, for the broad purpose of thoroughly inspecting, recovering, reclaiming, repairing, sorting and disposing of all salvage.

Conclusion

All primary accounting should be done at the division stores and consolidated at the general stores. In no other place can basic accounting be done as economically and accurately as at the storehouse. All materials must be received and checked by the storekeeper; the same material must then be priced and either invoiced to the using department or charged direct to the primary accounts. In no other way can the storekeeper keep control of the stock and control his business. The supply officer is the fiscal agent of the company. The money invested in material is enormous, every dollar tied up unnecessarily in materials and supplies is unliquid and unworking capital. The railway storehouse is not a reservoir for material, but a bank; material is not junk, but cash, and must be as safely guarded and controlled as cash in the treasury.

Amendment of Valuation Act Proposed

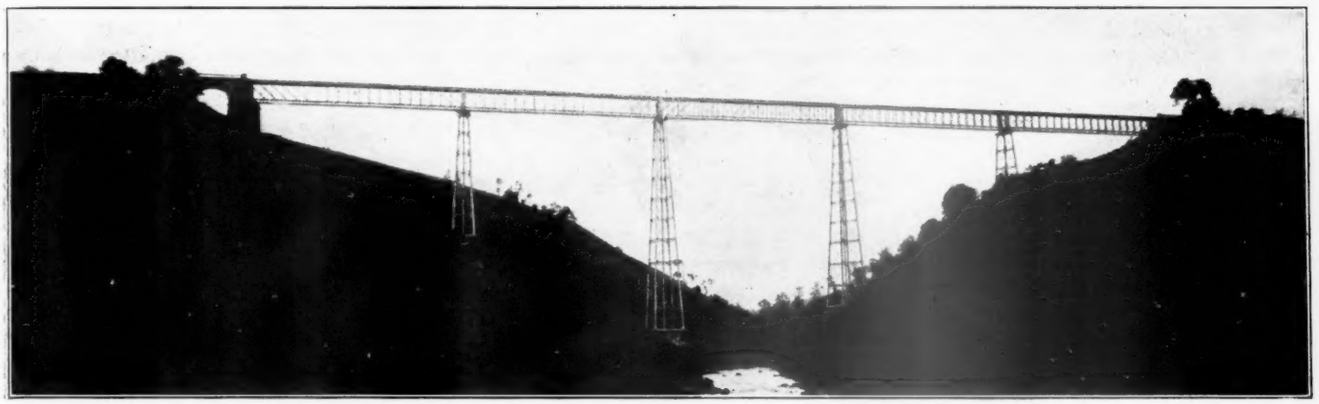
WASHINGTON, D. C.

AN AMENDMENT to the valuation act of 1913 by striking out the words instructing the Interstate Commerce Commission to ascertain and report the original and present cost of acquisition of railroad land was advocated before the House committee on interstate and foreign commerce on January 20 by P. J. Farrell, chief counsel for the Interstate Commerce Commission, and John E. Benton, general solicitor of the National Association of Railway and Utilities Commissioners, at a hearing on the bill introduced by Representative Esch. The bill would also make the provision of the act requiring the commission to report the cost of reproduction new apply only to property other than land.

Mr. Farrell said that since the decision of the Supreme Court in the Kansas City Southern case the commission's Bureau of Valuation has undertaken to find out what the carriers have had to pay in the past in order to get some estimate of what it would cost to re-acquire the land, but it believes that the estimate would not be worth anything when made. "The commission is doing its best to perform an impossible task," Mr. Farrell said, "but no man on earth can do anything but make a guess and he might just as well stay in Washington and guess as to incur traveling expenses and make his guess in the field." He said there is no basis for an assumption of what proportion of the land would have to be acquired by purchase or by condemnation or how much would be donated, and that unless the law is amended so it will not be necessary to make an estimate it will result in a farce because the commission would be driven to use a multiple.

Photo by International

The Lost Balloonists on Their Return to Rockaway



Malleco Viaduct on the Central Sur South of Concepcion

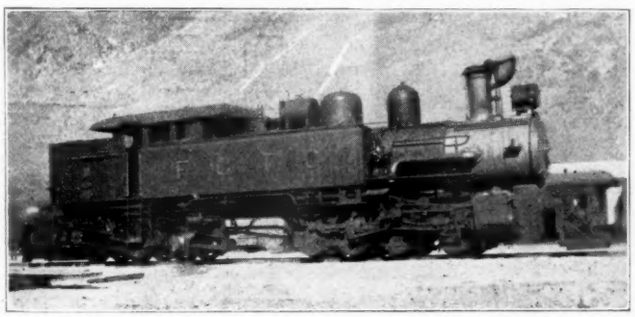
The Chilean State Railways Are an Open Market

Part III—Conclusion of a Discussion of Chile as a Prospective Purchaser of Railway Supplies

By John P. Risque

THE FIRST TWO PARTS of this article were devoted principally to a description of the Chilean government lines already in operation. This part of the discussion deals primarily with projects for new railways which are now under discussion in Chile.

As set forth previously, it is the intention to restrict this account of the Chilean railways to the state owned and



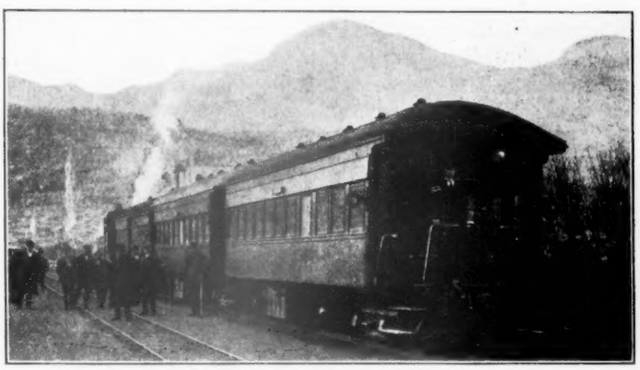
Combined Rack and Rail Locomotive on the Chilean Transandine

operated lines, but any reference at all to Chile's railways which omitted a description, however brief, of the Transandine Railway, famous all over the world, would possibly bring forth comment on the omission.

It is just as natural to open up a reference to a privately owned and operated line in South America with the statement that it is English as it is to buy a ticket before getting on a train, for, with few exceptions, such is the situation. The Chilean Transandine is British up one side, and its extension, the Argentine Transandine, is British down the other side. Both of them are of meter gage and contain frequent and long stretches of rack rail. The Chilean Transandine starts at Los Andes, the terminal of the 28 mile, broad gage branch of the Central Sur from Llai-Llai, between Valparaiso and Santiago, and runs 43 miles to the Argentine frontier, at an elevation of 10,459 ft. It is said that the grade of the last 7 miles of the climb averages 8 per cent. The rise is more than 3,000 ft. Twenty-five tunnels, more than 100 bridges and a string of snow sheds mark this stretch of track, the costs of operation of which frequently exceed the revenue. Passengers constitute the main traffic. Most of the freight traffic between Chile and Argentina is carried in ships south through the Straits of Magellan.

Southern Chile's winter months of June and July almost invariably shut the "Transandino" down with a snow-fall sufficiently heavy to obliterate the railway, snow sheds and all, and travelers' plans for crossing from Chile to Argentina via this line should always provide for these conditions.

If the picturesque scenery along the entire route from the quaint junction at Llai-Llai and the excitement attendant upon the departure of trains at Llai-Llai in three different



Transandine Train at Paradero Vilcuya, Chile

directions—all at about the same time—could be turned into revenue, the Transandine could sit back and take it easy; for of all the tourist's delights on a South American trip the novelties of this Transandine ride are the most enjoyable. Arriving at Llai-Llai from either Santiago or Valparaiso, the passenger is greeted by an array of women fruit sellers in white uniforms, lined up behind high banks of Chile's various delicious fruits, among which grapes figure prominently. In the pleasant excitement of rushing around to load up with fruit, it is quite possible to miss a train in

spite of repeated warnings from a hurried brakeman who claps his hands vigorously as he walks up and down the platform. When he has "clapped" the passengers all on board, the conductor acknowledges the fact by a shrill note from his pocket whistle. The engineer then climbs aboard and contributes his toot—and the stage is all set for the departure which duly follows.

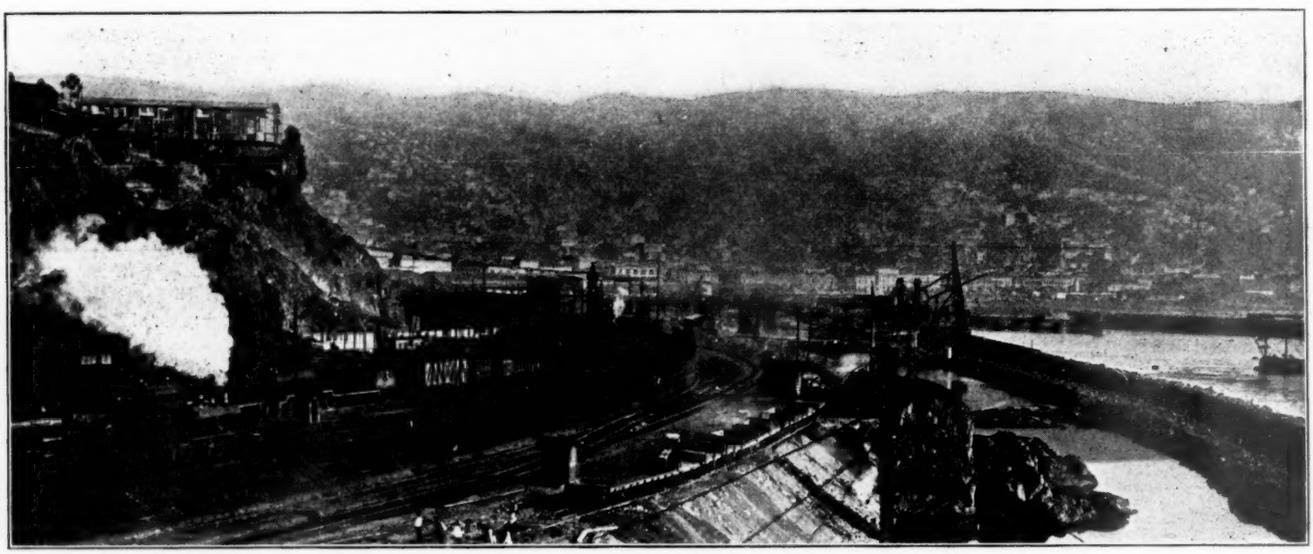
The ride to Los Andes is generally made in the evening. Rolling stock on that branch consists of three or four of the broad gage day coaches from the Santiago and Valparaiso trains and an inside connected British 0-6-0 type locomotive, the rather high drivers of which were found to be too strong for work as a switcher. At Los Andes, where the gage changes from 5 ft. 6 in. to meter, there is a warm welcome for the tired traveler, who is, by necessity, going to patronize the hotel in an enforced lay-over for the night.

At seven the next morning he will be on his way in diminutive meter gage cars, with seats on which the upholstery is so rigid that the traveler will be quite stiff and weary upon his arrival at Mendoza in the Argentine foothills of the Andes at the end of the day. The cars in use on this road resemble large trolley cars such as are in service on suburban lines in this country; some have entrances at one end only and the absence of foot plates on platforms over the couplers makes passage from one car to another an undertaking worthy of some deliberation. The magnificence of the scenery is indescribable—particularly in the vicinity of Juncal where the actual origin of the Mendoza river of the Argentine can be seen in the melting snows of mountain peaks which seem miles above the car window. Perhaps the prominence of this line in travelers' minds has been attained by the glowing descriptions of the ride from friends who have taken it.

An American railroader with his neck out of the window along with the rest of the crowd will sense a slight halt, like "taking up slack," as the train arrives at the foot of a section of rack rail. This precaution attends the engagement of the pinions on the axles between the frames of the rack rail engine, with the teeth in the rack rail in the middle of the track. At a station, an inspection of the locomotive on the head end of the train will reveal some interesting novelties among which will be noted the side-tank feature for water, so tenaciously adhered to by the Briton in his locomotive designs. The coal bin, as is usual in these side-tank types will have been built on behind the cab over an extension of the engine's frame. Two sets of single expansion engines drive the machine, the one in front propelling 3 outside cranks, in the center of the axles of which, between the frames, are mounted the pinions referred to. The rear engine of six coupled drivers is an ordinary rail engine. But the combination looks like a miniature Mallet in action—that is, when both engines are running. But when the locomotive is traversing sections devoid of rack rail, the front engine is stationary; while the rear set of pistons, rods and wheels are running fast and the railroader will probably look twice at a new species of Mallet, the like of which he never saw before—and probably will never see again.

Other Proposed Transandine Routes

Due to the difficulties of this Transandine Railway all of the way across, the change of gage from 5 ft. 6 in. to meter in Chile and back to the former in Argentina, together with the understanding that it would require a million and a half dollars to put the road in a position to earn money, of which about $650,000 would have to be spent upon the Chilean section alone to provide additional protection from snow-slides as well as for additional rolling stock, sidings and shops, considerable interest has manifested itself for years in proposed new Transandine routes.



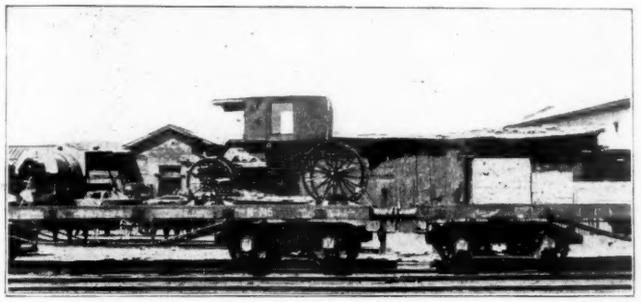
Yards on the Central Sur South of Valparaiso

About fifteen of these projects have come to light at one time or another. Most of them are planned to lie south of the present transcontinental line. The nearest actual approach to such a competitor is the San Martin line in the far south. This line runs from Colillelfu, east of Valdina, on the Central Sur, to Huidif, 19 miles inland. From there a highway transportation service is operated for 6 miles to Rinahue. Thence transportation is effected by steamer across Lake Rinahue, 19 miles, 27 more miles by road to Lake Llacar, 30 miles across that lake to San Martin in Argentina. All of this route in the intentions of the company will be served eventually by a railway.

Informed Chileans, however, believe that the first practical solution of a successful new Transandine project will make its appearance in the extension of a line to the Buenos Aires Great Southern's line which is in operation from Bahia Blanca on the Atlantic coast bay of that name to Neuquen, which lies on the boundary between the Argentine province of Rio Negro and Neuquen. This line is already built out to Zapala which is within 50 miles of the Chilean frontier. An extension westward through the Lonquimay

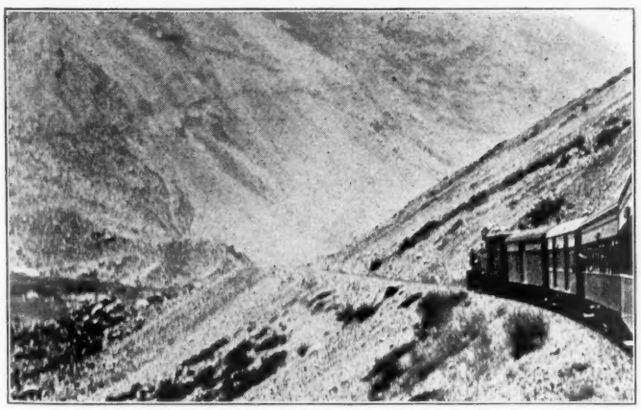
Pass would reach Curacautin on the eastern end of a branch line from the station of Pua on the Central Sur. The connecting of the gap between the latter point and Los Sauces will then provide an all rail transcontinental route from Bahia Blanca to the Port of Lebu, using the existing line from Los Sauces to the latter point. Considerable interest was manifested in the activities of the Buenos Aires Great Southern in the shipment of construction materials to Neuquen last March.

In the extreme north another important project is a subject of much discussion in the town of Antofagasta, where the citizens seem to be very earnestly behind a move to in-



Typical Chilean Flat Cars Typically Loaded

duce the Chilean congress to aid them in their ambitions to build a new line from Salta, Argentina, to either Antofagasta or the nearby superior harbor of Mejillones, 43 miles north. This proposed new transcontinental line has much to recommend it, particularly since it would permit the transportation of food and livestock from Argentina to the barren nitrate fields of northern Chile. The possibilities of such an undertaking have appealed to the president of Argentina, who has asked his congress to consider the proposition of extending the state railways from Salta west to the Chilean border to connect with the line which the Chileans propose to extend to meet it. The nearest port by



On a Rack Rail Section of the Transandine Near Juncal

rail from Salta is Santa Fe, 300 miles north of Buenos Aires, on the Paranaan river, and incidentally the administrative center of the Argentine Government Railways which radiate from that point in all directions but east.

The new line is estimated to bring Salta within 350 miles of a Chilean port and save the 350 miles of railroad haul from Santa Fe. The latter city is approximately 6,300 miles from New York; Antofagasta is 4,370 miles from the same point, thus offering a saving in the water haul of about 1,930 miles. New York freight for Santa Fe is at present routed to Rosario, where transshipment to smaller boats is necessary. The time required for the run from New York to Rosario is in the neighborhood of 24 days; from Rosario north to Argentine Andean points, including the Salta district, consumes from three to four days more. Cargo boats, on the other hand, from New York to Antofagasta, make the distance in 16 days. Adding two more days for the estimated time from the latter port to the Salta district, brings that region within 18 days of New York, thus cutting the time nearly in half.

The region in northern Argentina which will most benefit by the proposed new railway is said to contain an abundance of untouched natural resources including copper, gold, silver, alum, sulphur and soda, while the soil in this part of the country is rich, aided by a semi-tropical climate, tempered with varying degrees of altitude and suited to the easy cultivation of nearly all agricultural products. Fruits, vegetables, meats and sugar, the production of which is expected to be increased by the advent of the line, are some of the principal agricultural products of the territory referred to.

The total cost of the project is estimated at $25,000,000 and various plans for financing the line are under discussion, including interesting arguments relating to the gage to be used and the most suitable point for crossing the

Rio Blanco Station on the Transandine

Andes. The consensus of opinion favors meter gage and this is considered logical, due to the fact that that gage is used by the Argentine government lines as well as by most of the roads in the district of Antofagasta. Gossip among the interested ones in northern Chile frequently refers to an alleged objection to the building of the line by the southern Chilean farmers who claim to see in its construction a loss in their present shipments of cattle and food products by steamer from their rich fields in the south to Antofagasta and the nitrate regions beyond.

THE MAINE CENTRAL is giving service at less than cost. When the revenues received fail to cover necessary costs, a railroad cannot continue to give good service and cannot expand to meet the growing needs of the public. Increases in expenses in 1920 over 1917 amount to $9,000,000 for wages, $2,174,000 for coal and for other operating expenses in proportion. These increased costs have not been wholly covered by the increase in rates granted by the Federal and State commissions. The Maine Central has a low capitalization, all representing cash paid in, dollar for dollar. The Government appraisal of the property will show a value greater than the capitalization. The railroad is honestly and efficiently operated. The company is making and will continue to make every effort to increase efficiency and reduce the cost of operation, but it is evident that we cannot continue to give service below cost and live. This situation is against the interest of the people of Maine.—From Maine Central Time Table, signed by Morris McDonald, president.

New York Public Service Commission—Annual Report

THE PUBLIC SERVICE COMMISSION of New York, second district, has sent to the Legislature its fourteenth annual report, which is for the calendar year 1920. The first subject discussed is the action of the Interstate Commerce Commission in ordering an increase of passenger fares to 3.6 cents a mile, generally throughout the state, for intrastate travel, to correspond with the rate allowed for interstate fares. Reviewing the litigation by which the state has taken action in the courts to contest the federal orders, the present report says that the Transportation Act passed by Congress fixes a basis of rate-making for the railroads which is inconsistent with the standard of New York law, which contemplates rates based on what is just and reasonable in each particular case; and the state commission argues that passenger fares should not be uniform throughout the state; this for the reason that the service is not uniform.

"The fixing of such rates rests upon the assumption that the quality of the intrastate service, taken as a whole, is equal to the quality of the interstate service. Such is not the fact. The passenger service on the branch lines penetrating all parts of the state is notoriously not of the same quality as to speed, or wholesomeness, or comfort, or reliability, or value to the passenger. On these lines the freight traffic is too often given preference over passenger trains. The order of the federal commission compels the great mass of intrastate passengers to pay a first-class rate for a second-class or a third-class service."

The Commission does not wish to enter a contest with the federal government, but deems it its duty to have this issue settled by the courts. It proposes also to test in court the power of the federal government to regulate the issue of capital by the railroads, in disregard of the laws and the powers of the State of New York.

The police power of the Commission has not been affected by federal legislation and under this head the Commission has investigated automatic train control; and at the invitation of the New York Central it has created a joint committee of representatives of the Commission and of the railroad company to report on available devices and as to the selection of a section of road where devices can be tested. The Commission has recommended that some form of apparatus be installed on 50 miles of the main line of the New York Central, including all of the passenger locomotives on such section and 25 freight locomotives. It is hoped to report conclusively on train control before the end of 1921.

Grade crossing elimination has proceeded slowly because of unsettled financial conditions; but in Watertown and Rochester further appropriations are recommended; for important work has been begun and should not be dropped.

Inspection of railroads has shown serious problems in connection with deferred maintenance.

The number of accidents at highway grade crossings has increased, but the number of casualties resulting therefrom has decreased. Considering the vast number of automobiles using the highways during the summer, it is deemed remarkable that the number of accidents is so small. Increased protection has been ordered at certain crossings. The audible-visible signal is regarded as particularly well adapted to important highways in outlying districts. More extended use of this type is making motorists more familiar with them, so that they are observed and respected. Such signals are not infallible, but it is believed that the fact that they give practically continuous service, and that the times when they are out of service are infrequent and relatively short, makes such a signal highly desirable on main thoroughfares carrying a relatively dense traffic. The report is signed by the five commissioners, Charles B. Hill, Frank Irvine, John A. Barhite, Joseph A. Kellogg and George R. Van Namee.

Freight Car Loading

WASHINGTON, D. C.

THE NUMBER OF CARS of revenue freight loaded during the week ending January 15 as compiled by the Car Service Division of the American Railway Association shows an increase of over 3,000 as compared with the previous week, but is still considerably lower than for the corresponding weeks of the past two years. The total was 709,888, as compared with 840,524 in 1920, 758,609 in 1919 and 612,576 in 1918. The report follows:

REVENUE FREIGHT LOADED AND RECEIVED FROM CONNECTIONS

Summary—All Districts, Comparison of Totals This Year, Last Year, Two Years Ago. For Week Ended Saturday, January 15, 1921

Districts	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Mdse. L. C. L.	Miscellaneous	Total revenue freight loaded: This year 1921	Total revenue freight loaded: Corresponding year 1920	Total revenue freight loaded: Corresponding year 1919	Received from connections: This year 1921	Received from connections: Corresponding year 1920	Received from connections: Corresponding year 1919
Eastern	1921	5,892	4,437	45,605	1,479	7,655	1,360	41,463	53,751	161,642	.....	.....	188,192	.....	.....
	1920	5,641	4,380	53,978	4,170	7,915	1,309	32,707	91,879	.....	201,979	178,631	.....	225,559	203,981
Allegheny	1921	2,411	4,290	54,833	6,252	3,419	2,991	31,507	43,571	149,274	.....	.....	120,843	.....	.....
	1920	2,871	3,840	54,920	3,840	3,979	1,771	28,254	61,108	.....	170,583	166,375	.....	121,549	149,719
Pocahontas	1921	137	112	21,761	290	1,181	69	1,935	4,787	30,272	.....	.....	13,229	.....	.....
	1920	196	108	21,463	644	2,098	340	149	9,265	.....	34,263	30,848	.....	20,029	17,603
Southern	1921	3,852	2,162	26,391	708	12,147	1,866	33,777	27,785	108,688	.....	.....	59,086	.....	.....
	1920	3,696	3,015	28,955	163	17,582	2,460	19,358	55,990	.....	131,219	109,720	.....	77,983	62,570
Northwestern	1921	13,862	10,158	7,027	1,360	12,794	1,200	23,201	25,306	94,908	.....	.....	42,074	.....	.....
	1920	12,764	11,146	14,030	1,206	16,303	1,698	19,408	40,190	.....	116,745	112,714	.....	63,622	72,382
Central Western	1921	13,722	11,952	22,161	300	2,804	1,564	27,071	29,695	109,269	.....	.....	44,781	.....	.....
	1920	11,553	13,394	25,942	426	4,995	2,589	21,456	44,620	.....	124,975	107,564	.....	66,644	59,991
Southwestern	1921	4,985	2,014	5,450	94	5,241	540	14,546	22,965	55,835	.....	.....	41,503	.....	.....
	1920	4,099	2,815	8,573	196	6,142	578	14,162	24,195	.....	60,760	52,757	.....	51,907	43,014
Total all roads	1921	44,861	35,125	183,228	10,485	45,241	9,590	173,500	207,860	709,888	.....	.....	509,708	.....	.....
	1920	40,820	38,698	207,861	10,645	59,014	10,745	145,494	327,247	.....	840,524	.....	.....	627,293	.....
	1919	45,538	42,715	190,691	.....	51,904	14,766	.....	412,995	.....	.....	758,609	.....	.....	609,260
Increase compared	1920	4,041	.....	.....	.....	.....	.....	28,006	.....	.....	.....	.....	.....	.....	.....
Decrease compared	1920	.....	3,573	24,633	162	13,773	1,155	.....	119,387	130,636	.....	.....	117,585	.....	.....
Increase compared	1919	.....	.....	.....	10,483	.....	.....	173,500	.....	.....	.....	.....	.....	.....	.....
Decrease compared	1919	677	7,590	7,463	.....	6,663	5,176	.....	205,135	48,721	.....	.....	99,552	.....	.....
January 8		39,690	31,494	190,284	11,479	42,982	10,717	169,093	210,674	706,413	830,673	723,801	492,817	596,859	543,265
January 1		30,098	23,950	170,224	10,550	32,635	8,340	144,657	178,451	598,905	745,446	612,741	453,537	591,437	525,055
December 25		29,147	19,814	177,308	10,956	39,314	9,497	158,918	194,321	639,275	684,784	549,975	514,363	588,644	562,602
December 18		35,505	30,470	223,153	12,750	48,626	14,127	186,997	245,230	796,858	806,734	796,116	587,099	576,770	672,533

L. C. L. merchandise loading figures for 1921 and 1920 are not comparable, as some roads are not able to separate their L. C. L. freight and miscellaneous of 1920. Add merchandise and miscellaneous columns to get a fair comparison.

How to Increase the Average Loading of Cars

Pertinent Suggestions from Railway Officers Who Have Given This Subject Close Study

MAXIMUM CAR LOADING is a matter of dire necessity during periods of car shortage. It is also an essential to the economical conduct of transportation. Although the necessity for conserving cars has been temporarily decreased, the requirement of economy is now more imperative than at any time in the last 12 months. Therefore, the suggestions offered by railway officers and others who contributed articles in a contest on "Means of Increasing the Average Loading of Cars" should be of distinct value to the railway managements in the herculean efforts which they are now making to conduct the operations of their properties with utmost economy.

The 25 papers received in this contest were referred to a committee of judges consisting of L. W. Baldwin, vice-president, Illinois Central, Chicago; F. T. Bentley, traffic manager, Illinois Steel Company, Chicago, and C. E. Spens, vice-president, Chicago, Burlington & Quincy, Chicago. These judges awarded the first prize to the paper submitted by G. D. Brooke, superintendent of transportation, Baltimore & Ohio, Cincinnati, Ohio, and the second prize to the paper prepared by O. C. Castle, superintendent of transportation, Southern Pacific Lines, Houston, Tex. Other papers received which merit special attention are those submitted by C. F. Balch, assistant general auditor, Chicago & North Western, Chicago; P. W. Coyle, traffic commissioner, St. Louis Chamber of Commerce, St. Louis, Mo.; E. H. Shaughnessy, American Petroleum Institute, New York; C. W. Hoisington, San Francisco, Cal.; J. L. Coss, train despatcher, Chicago, Rock Island & Pacific, Haileyville, Okla., and D. J. Stevens, division superintendent, Baltimore & Ohio, New Castle, Pa. The prize winning papers and three others are presented below:

First Prize—Use Large Capacity Cars in Heavy Loading Service

By G. D. Brooke

Superintendent of Transportation, Baltimore & Ohio, Cincinnati, Ohio

It is of prime importance that the marked capacity of each car be the highest consistent with the requirements of safe operation. General practice permits the loading of cars 10 per cent in excess of the marked capacity. There are great possibilities in the utilization of this margin, for with many classes of loading advantage can be taken of it to gain one car in every ten and to increase the average carload correspondingly.

With the cars properly rated the next step towards increasing the average loading is to distribute the equipment so that cars of high capacity will be used for long haul traffic and where practicable loaded in both directions. If we can add to these two conditions of service, that of prompt loading and unloading, a maximum efficiency will be obtained. A familiar example of such utilization is the placing of high capacity coal cars in the lake coal and ore service. Light capacity cars should be used for moving coal from the mines to inland points close by the mining districts. High capacity box cars can be used to good advantage in the long haul movement of heavy commodities, such as grain and lumber, while the light capacity cars are assigned to the movement of light bulk freight, like straw, paper stock, etc., and to short haul business, trap-car loading, inter-terminal movements, package locals and similar service to which are attached inherent delays and slow movements.

Certain kinds of freight are peculiarly adapted to heavy loading both on account of the great weight per unit of volume and the large quantities offered for shipment. Ores, pig iron, mill products, stone, gravel and sand are good examples. With these and other similar freight the problem of maximum loading is simple. With bituminous coal skilful loading is required in order to take advantage to the fullest extent of the cubical capacity of the cars. Coke should be loaded to the full cubical capacity of the car and a generous crown added to compensate for the shaking down of the load when the car is set in motion.

The railroads load a large number of cars daily with their own forces. This loading can be divided broadly into two general classes—company material and commercial l.c.l. freight loaded at freight houses. The former consists both of c.l. and l.c.l. freight and the same general methods of loading are applicable as with commercial business. Commercial l.c.l. freight requires for its movement a very considerable percentage of the available box cars. Taken on the whole it is of light weight and the load of the average l.c.l. car is doubtless considerably under eight tons. This freight is for the most part loaded by the railroads themselves and the opportunities for increasing the car load are many. With proper care in stowing, the loading of merchandise cars to the full cubical capacity of the car should not increase the breakage and other damage and any delays to freight in holding it for full carloads are overcome by through movement when the car is started. When the tonnage for a single destination is not of sufficient volume for a daily car then resort can be had to such expedients as bi-weekly, tri-weekly and other periodic cars, loading cars to two or more destinations and loading on transfer stations. It is important to establish a minimum weight limit for carloads to apply unless the cubical capacity of the car determines the load.

The multiplicity of activities on a great railroad system is such that specialists are often required to direct the efforts of officers and employees in obtaining certain desired results. This applies to increasing the car load. For unless some individual or bureau is charged with the responsibility of keeping the question alive it will be lost sight of from time to time and much progress which has been made will be lost. A bureau consisting of a small office force and two or three traveling inspectors or instructors, in charge of an officer of suitable experience, can accomplish much in increasing the carload. The traveling instructors should visit large shippers and stations, instill and foster interest in heavy loading, assist in instructing employees and offer helpful suggestions regarding methods of loading. The office force should obtain such records as to enable it to compare the monthly performance of the various stations and of industries, including railroad store houses and other plants where the loading is heavy.

Suitable statements embodying these comparisons when placed in the hands of the superintendent will show him what progress is being made at the stations and industries on his division and will enable him to take steps to correct backward tendencies and to offer encouragement where the showing is good.

The chief duties of the bureau are to maintain interest

in the campaign for increased loading, to establish for the several divisions standards adapted to their loading conditions, and to see that the same general methods are used over the system. But the brunt of the campaign must of necessity be borne by the operating and traffic officers, the agents and other employees—the rank and file of the division organization. The superintendent who takes an active interest in the carload will infuse his entire organization with a like interest by discussions at staff meetings, by personal talks with officers and agents and by suitable written instructions. He should not fail to take advantage of the experience and ability of the personnel of the traffic department in dealing with the public but should lean heavily on that arm of the service in placing the problem before the shippers. The agent has a most important part to play in applying the cars at his station where best adapted to the loading offered, in watching his l.c.l. loading, and in obtaining the co-operation and assistance of the shippers with whom he comes in daily contact. The assistant superintendent, the train master, division engineer, master mechanic, yard master, all division officers, have their parts to play in direct supervision, in instruction of their employees and in their relations with the shipping public. Thus the concerted efforts of the officers, of a large number of employees and of many shippers are brought to bear on the problem, not to the exclusion of but in conjunction with the other important phases of efficient transportation, and there can be no results other than the attainment of creditable car loads.

Second Prize—Keep a Close Watch on the Loading

By O. C. Castle

Superintendent of Transportation, Southern Pacific, Texas Lines, Houston, Texas

A celebrated statesman once said "The way to resume is to resume," and in connection with the campaign for increased efficiency we may well paraphrase this and say "the way to secure heavier car loading is to load cars heavier." Like the "miles per car per day" problem the solution depends largely on the co-operation of the public. The public, divided generally into two parts, forms with the railroad a triangle, the three sides of which are:

(A) the carrier, (B) the consignor and (C) the consignee.

To follow the geometrical figure, we may call our triangle a right angled triangle with the consignee the hypothenuse, the square of which is equal to the square of the other two sides. To elucidate: In general the consignor is as much interested in loading to capacity as is the carrier. It is safe to assume that his gains are related to the volume of his shipments. The consignee, on the other hand, may have therefore, be disregarded or at least deferred in the consideration of means for accomplishing immediate results.

Turning then to practical and practicable plans, the problem reduces itself into one of supervision over actual loading of the individual car under existing conditions. For this purpose, the first essential is a system of complete and accurate reports. Loading stations should compile weekly reports showing their car loading in detail, the following items being suggested as a basis: Date, car initial and number, destination, contents, car capacity, weight of contents and remarks. Station reports should be assembled currently and checked in division and general transportation offices. Examination of these reports will develop instances of light loading, or the use of cars of greater capacity than necessary for particular commodities. Attention of loading agents and car distribution forces should be called currently to such instances. Monthly compilations should be made of car loading reports; averages of tons per car and per cent of capacity utilized being extended, separated by principal commodities and for operating divisions. Comparisons with previous periods should also be shown. These statements should be sent to interested officers, who should be required to study the performance and concentrate on the weak spots as developed by the statistics. The following form is suggested.

From the general office, letters and circulars should be issued from time to time outlining the performance. Good results may be secured by the use of graphic charts indicating the standing of the divisions in order to introduce the competitive feature.

The selection of a particular commodity, one which moves in large volume, during a certain period, and an analysis of the conditions surrounding its handling can be made productive of results. Experiments should be made in intensive loading of such a commodity and the method of loading demonstrated to be the most economical, reduced to charts or blueprints, for circulation among those interested. Where marketing conditions or commercial units affect the size of the load, conferences should be held with individuals, firms or associations interested in the particular commodity in an effort to secure co-operation in improved loading.

But while much may be achieved in the handling in wholesale, the real effective work must be done in the retail realm. Constant supervision over the loading of the individual car, and close following of shipping points must be supplemented by missionary work directed at the consignee whose light order is often responsible for a light load. For this purpose, a report should be required from destination points, showing all cars received with loads that do not utilize either the weight or space capacity of the car. These reports should give the name of shipper and consignee as well as the point of origin, and destination. They should

CARS LOADED AT STATIONS

Sheet No.———

———Freight Month of———, 191—

Divisions and commodities	Cars loaded		Capacity of cars—tons: Total		Capacity of cars—tons: Average per car		Weight of contents—tons: Total		Weight of contents—tons: Average per car		Percentage of contents to capacity	
	191—	191—	191—	191—	191—	191—	191—	191—	191—	191—	191—	191—
1	2	3	4	5	6	7	8	9	10	11	12	13

many reasons for purchasing in small quantities, and his attitude toward the heavy car load is, therefore, in natural opposition to that of the carrier and the consignor. The most logical and simple expedient to correct this tendency on the part of the consignee is a proper adjustment of car load minima. Some progress is being made along this line, but it requires time to correct iniquitous practices that have developed over long periods. This direct method must, also show the commodity, car capacity, weight of shipment and per cent of capacity utilized (both weight and space). The supervisory officer may then handle by correspondence or otherwise, with either the shipper or consignee for an increase in the weight of future shipments.

There are many commodities, the nature of which will permit of "double loading" by which is meant the consolidation in a single car at point of origin of two minimum car

load shipments for different destinations or consignees. Such loading should be limited to shipments moving in the same general direction, and the handling should be covered by special instructions to avoid delays and mixing of shipments. Checking of such reports with car distributors daily will suggest means for inducing a better utilization of cars through regulation of the supply.

Contests between loading stations with cash prizes for excellence in car loading is an effective means of stimulating interest. To insure fairness and to give the widest possible range to the contest, the prizes should be fixed by commodities with possibly an additional prize for the best record in loading all classes of freight.

While the shipper and consignee are the partners of the carriers in loading of car load freight, the carriers have within their control, a large item in the merchandise loading, which by its nature makes for light loading. This traffic constitutes possibly 10 per cent of the loading on many large roads. To supervise this item properly, the transportation office in conjunction with the traffic department should carefully analyze the merchandise traffic and establish l. c. l. schedules, scheduled cars should be run regularly, and loading stations prohibited from running unauthorized cars. Daily reports of tonnage should be required, the figures tabulated and carefully analyzed to detect schedules which are not justified by the traffic offered, or to indicate where schedules may be changed to the advantage of the service.

If a program based on the methods suggested in the foregoing is undertaken by the transportation organization, with the co-operation of the traffic department and the support of the management, and if intensive supervision is applied to the fulfillment of the program, a marked improvement in loading is almost certain to follow.

Watch the Loading at Every Angle

By J. L. Coss

Train Despatcher, Chicago, Rock Island & Pacific, Hailey-ville, Okla.

The railroads and shippers should take measures to induce the Interstate Commerce Commission to authorize general increases of minimum car load weights and no effort should be spared to increase the loading of less than car load freight. A vigorous campaign should be waged by the representatives of the railroads among the shippers through the different shippers' associations, chambers of commerce and also through the newspapers.

Every time a railroad representative, regardless of his position, is within reach of a gathering of business men he should take advantage of any possible opportunity to talk on the subject of loading cars to capacity, or rather—10 per cent above capacity. He should also make it a point to enlist the attention and kindly feeling of the draymen, truckers and others who actually load the cars in such a way as will cause them to take a personal interest in this important matter. It is the fellow that does the actual work who can sometimes help out in more ways than one.

Articles by recognized authorities on transportation appearing from time to time in the leading newspapers will have a tendency to encourage shippers and railway men toward the loading of cars to capacity. The magazines published by the railroads should contain articles on heavier car loading together with statements showing tonnages loaded in cars for a certain period. The agent obtaining the best record in car loading should be very strongly commended in the magazine. The managements should take the employees into their confidence, telling them of the results secured, thus creating in them an interest in the matter.

The station agent is one of the most important factors in the matter of producing the capacity loading of cars and he should be dealt with in a way that will insure such loading of all cars from his station. At transfer points he can work miracles by looking after the cars which are interchanged. By exercising a little diplomacy he will gain the good will of the shippers who will be more than glad to assist him in making his record for full car loading complete. The "sailing day" plan for handling merchandise should be adhered to; this makes for a larger amount of l. c. l. merchandise loading per car. However, with this practice in effect too many local merchandise cars leave the terminal each morning in the local freights; many of these cars could have been consolidated into a less number.

At all staff meetings general talks on the subject of car capacity loading will have a tendency to stimulate the employees in general and especially agents and local trainmen whereby they would be induced to watch the matter closely.

Conductors should be appealed to in the matter of setting out cars for loading and especially at blind sidings and set out the kind of car applicable to the commodity to be loaded and obtain a capacity load. Chief despatchers and car distributors should familiarize themselves with the class of loading at different points on their divisions and give conductors such information as will be of benefit to them in furnishing the cars which can be utilized to advantage in securing heavier loading. If a small car is ordered for a station it should be furnished instead of a large one, because the larger car can better be used somewhere else. This is a matter which should be watched closely by all supervisors when making trips over the road.

At small stations, where beginners in the station service are generally placed, and some of the larger stations as well, the agent as a rule does not look personally after the loading of cars but leaves it to the shipper and the latter generally leaves it to the drayman. Where such conditions exist the trainmasters and other supervisors can do some good missionary work both with the agents and the shippers. But this must be done in a diplomatic way.

Trainmasters and other supervisors should spend more of their time visiting stations in the interest of heavier car loading, and they should by no means miss the blind sidings where considerable loading is done at certain times of the year by farmers and teamsters who do not appreciate what capacity loading means. Here is where the supervisors can make a good showing by teaching these men what is desired and how to get it.

Co-operation among the shippers and their forces and the representatives of the railroads will do more to produce capacity loading than anything else. However, when good results have been reached do not allow empty cars to stand idle on the side tracks under the eyes of the shippers who have been urged to load cars to capacity.

At coal mines, rock quarries, lumber mills, and similar places, where there are no track scales for weighing cars, many cars go out light loaded. If such industries cannot be prevailed upon to install scales it would pay the railroad company many times over to put them in.

It is impossible, in many cases, to load lump and nut coal to capacity in the ordinary coal car because the sides of the car are not high enough. In order to secure capacity loading of this commodity the railroads should equip such cars with side boards six or eight inches high with hinges and stakes.

At points where bulky freight such as furniture and similar commodities are loaded special care should be exercised by agents and yardmasters and engine foremen to see that the proper sized cars are set which will admit of loading as near as possible to capacity and the shippers prevailed upon to load every pound they can in the cars. Many times the shippers can be induced to knock down bulky freight, with a very little labor on their part, thereby loading more

in the car and at the same time secure a reduction in rate as against the rate they would pay for the freight in a set up condition. Here is where the station agent and the traffic man can use his influence to advantage with the shipper.

Organize a Car Loading Bureau

By C. F. Balch
Assistant General Auditor, Chicago & North Western, Chicago

The fundamental principle upon which we are to proceed is that in order to secure heavier loading, we must solicit the interest and effort of the man who is loading the car. This man is the shipper, so far as all c. l. traffic is concerned, and the freight house force, so far as the l. c. l. traffic is concerned.

The l. c. l. traffic is a large factor inasmuch as on the average railroad, possibly one-half or more of all box cars are engaged continuously in this traffic. The l. c. l. freight originates in the principal cities and distributing points, and in a general way, moves opposite to the general direction of traffic. Many cars, if not used in l. c. l. traffic, would move empty to the points where car load traffic originates.

This consideration has probably had much to do with the light loading of merchandise traffic, inasmuch as the loaded car moving considerably more promptly than the empty car, finds itself out of the large city where it is needed for car load loading, and the movement of the car to this point is more to be desired than to secure a maximum load of l. c. l. freight. Therefore, a large portion of l. c. l. freight traffic, principally that which is local, originating and terminating on the one line, is excluded from interest. It does not, however, apply to freight traffic destined to points on connecting lines unless it is desired to secure a movement of foreign empties to points of destination.

As c. l. freight is loaded by the shipper, it is necessary to interest him in the question of increasing the loading. When cars are scarce the shipper should load a maximum load whenever he secures a car for the transportation of his commodity. At such times, minimums are ignored, and are not a governing factor. A little intelligent propaganda placed in the hands of shippers will have a very large influence in securing their interest in a maximum load. Shippers, however, are confronted always with the difficulty of receiving from their customers orders for a maximum car load, because by loading a minimum car load, they can secure a car load rate. The only way to overcome this tendency of the shipper is to *increase the minimum.*

The United States Railroad Administration did much to help this situation, but with the return to private control, and the restored authority of the state commissions there have come into being many minimum weights and rates applying to intrastate freight traffic, which should be raised to the standard set by the Railroad Administration.

Freight traffic includes certain commodities which cannot well be loaded heavier than at present. The livestock traffic is an example of this, the nature of the commodity forbidding heavier loading. Certain other commodities are being loaded as heavy as practicable, and yet are far below the average load of all cars. Coal and ore are examples of commodities which are already being loaded to the maximum capacity. It is, therefore, necessary to direct special attention to those commodities which are susceptible to heavier loading, and which may well respond to an intelligent effort.

A study of commercial conditions which have been governing factors in determining the practicable minimums heretofore, would disclose opportunities for raising many of the low minimums which now exist.

This subject is worthy the entire attention of a special staff, and it is suggested that a heavier loading bureau be established either in the office of the superintendent of transportation, or the chief operating officer, as may be deemed advisable. The duties of this bureau would be to study the subject and assemble and disseminate such information as is necessary to carry on an intelligent propaganda.

Emphasis is here placed upon the necessity of showing the loss of revenue to the carriers which results from underloading. To illustrate: A car loaded with 20 tons of freight, moving at 15 cents per cwt., would aggregate revenue of $60. If loaded to capacity of 40 tons (presuming the capacity of the car is 80,000 lb.) it would yield revenue of $120. The loss of revenue in this case is $60. This fact, brought to the attention of the agent, or the shipper, would impress on him that if he desires low freight rates, he must co-operate with the railway to produce the largest revenue from the use of each unit of equipment.

It is suggested that an examination be made of way bills when received by the auditor of freight accounts; that comparisons be made between the actual load and the capacity of the car, and wherever the car is underloaded, a record be taken showing the description of the load and the facts which will indicate the underloading. This information should be used by the officer of the car loading bureau to direct the attention of the agent to the fact of underloading and to point out to him the loss of revenue accruing to the carrier through that condition.

Take Photo-Records of Light Loads

By D. J. Stevens
Division Superintendent, Baltimore & Ohio, New Castle, Pa.

The success which any railway division secures in increasing car loading is largely controlled by the amount of effort that the division superintendent puts into the work, in planning a campaign for his staff, and outlining a policy which is workable and practicable. The methods employed vary largely with the commodity to be loaded. For example, I have found in the coal fields that a camera is an extremely helpful instrument in increasing the tons per car. My method has been to have a man with a kodak go through the mine districts periodically to take pictures of any cars which do not show full loading. These pictures, with the name of the mine, date and car number written on the face, are shown the mine owner or operator personally or are sent him with a letter. His attention is directed to the empty space in the car, and to the fact that his light loading of the car is depriving him of the additional loading space.

Careful records maintained daily of our ore loading at the docks, making comparison with the loading for the previous month and same month previous year, and placing these figures in the hands of the superintendents of the docks, as well as their superior officers, has resulted in a net gain of approximately 20 per cent.

The two remaining items which I have dealt with have been that of persuading the big industry and the small individual car loader to increase his load per car. Frankly, I have found that the big industry is not only desirous of assisting but has co-operated even more than I expected.

My staff officers and myself, in going over the division, stop and visit the officers of the industries having charge of this phase of the plant operation, discuss with them the car situation, call to their attention how many more cars are available for their loading by increasing their load per car, and we have asked them to have their salesmen cooperate to the extent of asking the consignees to buy in car-load lots. The real hard job in the campaign has been with the men who load two or three cars a week. They have not grasped the idea as quickly as have the big shippers and we have not made the gain with them up to the present time that we have with the big shipper.

Outside Repairs to Railway Equipment Justified

Statements of Various Railroad Executives Prove That Conditions Warranted Repairs by Contract

FACTS CONCERNING THE LETTING of contracts for repairs to railway rolling stock to outside concerns, which have been made public in statements of several railway executives, prove conclusively the fallacy of the contention of W. Jett Lauck of the International Association of Machinists that the big railroads "are closing their repair shops and giving repair work at extortionate rates to large private equipment companies." These charges are being investigated by the Interstate Commerce Commission.

Mr. Lauck attempted to show by figures of his own compilation that the average cost of repairs made by private equipment companies was considerably higher than repairs made in the railroads' own shops. He did not, it is pointed out by several of the executives, take into consideration that the repairs made under contract were of much greater extent than those taken care of in the railway shops nor did he allow for overhead charges in his estimates of costs for repairs in railway shops. The executives draw attention to the fact that the overhead costs are included in the charges made by equipment companies for these repairs. They also show that the severe congestion of traffic last year, resulting in heavy losses to business, made it imperative that all available equipment be put into service as rapidly as possible. They feel that this fact alone would seem to justify almost any step taken by the railroads to relieve the situation.

How the Traffic Congestion Was Met

A statement given out by T. DeWitt Cuyler, chairman of the Association of Railway Executives, is quoted herewith in part:

"In the inquiry before the Interstate Commerce Commission the railroads are prepared to show:

"1. That on the return of the railroads on March 1, 1920, there was an abnormal number of locomotives and cars in bad order requiring repair and an abnormal number of locomotives then in operation which would nevertheless require 'shopping' at an early date.

"2. That it was impossible to take care of all of these repairs, immediate and prospective, within any reasonable length of time in railway companies' shops.

"3. That at the time most of this equipment was sent to outside shops for repairs there was one of the worst traffic congestions in the history of the country, and that the railway companies were properly under the pressure of the Interstate Commerce Commission, the Car Service Division of the American Railway Association, and of their shippers, to use any and every available means to restore this equipment to service at the earliest possible date.

"4. That generally when equipment was sent outside it was to the company which had originally constructed it, for the obvious reason that the original manufacturer had the patterns, extra parts and machinery which would enable him to effect these repairs more promptly than could be done elsewhere; that if for any reason the original manufacturer could not accept such cars, then the nearest available shop having adequate plant and available capacity was chosen; and that these were the considerations which controlled the choice of outside shops, and not any alleged dual interest between equipment and railroad companies.

Non-Comparable Figures Compared

"5. That with regard to cost, the comparative figures given are entirely misleading, as so-called cost figures in railway shops cover substantially only cost of material and labor, most of the expense—overhead, supervision and maintenance—being carried in other railway accounts, and being further misleading because cost in outside shops necessarily includes a reasonable profit.

"6. Furthermore, that the comparisons of cost given are erroneous and misleading because in many cases the equipment sent outside required the heaviest kind of repairs, sometimes amounting to substantial rebuilding, frequently including additional improvements, and in general not being comparable to the normal classified repairs in a railway company's shop.

"7. That, as additional proof that the companies had no ulterior purpose in sending this equipment to outside shops for repair, the companies were merely carrying on the practice of following the precedent established by the United States Railroad Administration during similar but lesser emergencies.

Employees' Responsibility for Situation

"8. That certain organizations of railroad employees, through the Shopcraft Agreement signed by them with the United States Railroad Administration, are themselves in part responsible for the inability of the railway managements to expand the capacity of railways' shops. Reference will be made particularly to Rule 153 of the National Agreement with the Shopcrafts, by which the railroads are precluded from employing upon the repair of cars any men who have either not served an apprenticeship or have not had four years' previous employment in car repair work. Under this provision the railway companies at the time of their greatest need were prevented from adding to their forces competent and available painters, carpenters, machinists, blacksmiths and others necessary to increase the capacity of their car repair plants.

"9. That the equipment sent to outside shops constituted only a small part of the equipment in need of repairs.

"10. That nevertheless the value of the equipment imperatively demanding repair and beyond the capacity of railway companies' shops in the spring of 1920, represented an investment of many millions of dollars, and that the contention that this equipment should have been held out of service for months or even a year until it could be repaired in railway shops, is a proposition in violation of all respect for the public's right to service and of good business and sound management.

"The truth is that the effect of the rules and working conditions still controlling the repair of equipment in railway shops has been disastrous to efficiency and output, and is in itself one of the causes of the abnormal number of cars and locomotives out of repair.

"Insofar as the organizations of railway repair employees have helped to produce a situation in which all of the railway repair work could not be taken care of in railway plants, or where outside plants can now do the work more economically and speedily than railway shops, they have only themselves to blame.

The Public's Own Stake in the Case

"The real point of public concern at the present time is not the measures taken by the railway companies for the repair of cars and locomotives in 1920, but is the question now before the United States Railroad Labor Board at Chi-

cago, as to rules and working conditions in railway companies' shops.

"This involves millions upon millions of dollars, which, in the last analysis, are a charge to be paid by the public for its railroad service. These costs, often for work not even performed, result from unjust and burdensome regulations, which the railroads are seeking to have changed."

Mr. Cuyler in connection with his statement included the following quotations from letters of several executives.

H. E. Byram, president, Chicago, Milwaukee & St. Paul, said:

"Work done on twenty locomotives at Baldwin Works was not ordinary repair work, but complete rebuilding of locomotives and converting them from compound to simple type. This involved almost as much work as building a new locomotive. The converting of these engines from one type to another involved a class of work which could not be done as economically in our own shops as at shops of Baldwin Works, where these locomotives originally were built and where the necessary facilities were available for rebuilding them in most economical manner. These locomotives were obsolete type, several of which had not been used for several years, and when turned out of shops were practically new engines and cost less than one-half the price of new locomotives."

Relative to work done in outside shops for the Chicago, Burlington & Quincy, President Hale Holden said:

"The only arrangements of this character made by this company were with Baldwin Locomotive for seven and with Davenport Locomotive Works for seventeen. It was after careful survey of our power. Situation indicated that during previous two years the condition of engines was below normal and so many required overhauling we would be unable with our own facilities, and considering limitations as to employing machinists provided by schedules with labor organizations made during Federal control, to have sufficient power to satisfactorily handle the heavy traffic through winter months."

W. H. Finley, president, Chicago & North Western, is quoted as follows:

"At the beginning of Federal control we had 175 engines out of service for repair. At the end of Federal control there were 386 engines out of service, and the number of engines that were good for but sixty to eighty days' more service was as much greater at the end of Federal control than at the beginning as the number actually out of service.

"Have had repairs made by American Locomotive Company. The first locomotives so repaired were sent to outsiders during Federal control by Railroad Administration. The company has continued sending locomotives at same cost. Railroad Administration sent thirty-five. Company has sent thirty."

Lacked Capacity to Do Work in Own Shops

The following statement was made by J. R. Kenly, president of the Atlantic Coast Line:

The Atlantic Coast Line has been mentioned as one of the roads having equipment repaired in outside shops, with the intimation that some of its officers or directors were personally interested in such outside shops. The Baldwin Locomotive Works has practically rebuilt 20 A. C. L. locomotives and is rebuilding 10 more. Two were sent to the American Locomotive Works for repairs. The contract for the first 10 was made during federal control, with the full concurrence of the regional director, and the work upon them was begun before the end of federal control. No cars have been repaired at outside shops.

We estimate that the efficiency of the A. C. L. shops was decreased not less than 30 per cent during the period of federal control by the reduction of the work day from 10 to 8 hours, by the forced abandonment of piece work, by the forced obligation of the closed shop, and by successive federal interpretations of the rules and regulations governing shop control and operations.

It was the result of these conditions which made the regional director recognize the necessity for this outside work.

Bids for rebuilding were requested from the Baldwin and from the American Locomotive companies and the contract made with the lowest bidder.

No director or other officer of the A. C. L. has any direct or indirect interest in either the Baldwin or the American Locomotive companies.

When the federal government took over the railroads on December 31, 1917, there were 112 engines out of service requiring repairs. At the end of federal control on March 1, 1920, there were 202. A locomotive is supposed to be near the time of shopping for major repairs when it has made 100,000 miles. On December 31, 1917, the following was part of the locomotive record:

Locomotives having made less than 40,000 miles	297
Locomotives having made more than 100,000 miles	93

On March 1, 1920, when the railroads were returned to their stockholders:

Locomotives having made less than 40,000 miles	246
Locomotives having made more than 100,000 miles	118

Add to this condition a decreased shop capacity of not less than 30 per cent and you have the reason why the Atlantic Coast Line was forced to employ outside shops if it was to meet the demands of the public for transportation service.

It is true that it costs a railroad company more to have its locomotives repaired outside than in its own shops.

A locomotive builder must make a profit which is not included in the cost of a home shop.

It is, however, untrue that the Atlantic Coast Line is paying for repairs or rebuilding in outside shops four or five times what it would cost to repair or rebuild at home.

The difficulty in the case of the Atlantic Coast Line was that it could not rebuild at any cost these 30 locomotives in its own shops for the reasons stated.

Since federal control ended the Atlantic Coast Line has ordered over $1,000,000 of modern shop tools and machinery and has increased its motive power organization and it hopes to be able under changing conditions to meet future repair and rebuilding equipment requirements without the assistance of outside shops.

The Lehigh Valley

E. Loomis, president of the Lehigh Valley, in a statement issued to the press, lays the necessity for resort to outside help in repairing cars at the door of the Railroad Administration because of its failure to maintain a sufficient number of cars in repair and, moreover, because of reduced shop efficiency resulting from the abolition of piece work and the enforced continuance of the national wage agreements which were entered into by the Administration.

Returned in Condition to Make Outside Repairs Necessary

J. M. Kurn, president of the St. Louis-San Francisco, likewise blames the Railroad Administration for returning the rolling stock to the roads in such condition that outside repairs were made necessary. He states further that "work done in the contract shops has cost and is costing less than similar work" in the company's shops. He calls attention to the apparent policy of some of metal craft unions to curtail production, thus making necessary resort to outside shops in order that a high percentage of equipment be kept in service.

Photo by International

Indians at the Tehuantepec, Mexico, Station Awaiting with Their Wares the Arrival of a Passenger Train

Cause of the Present Condition of Freight Cars*

Pooling, Deferred Retirements, Labor Conditions and Abuse in Service; the Remedies Suggested

By J. C. Fritts
Master Car Builder, Delaware, Lackawanna & Western, Scranton, Pa.

WHEN A BAD CONDITION is found an effort should first be made to find the cause and then work out some method by which the evil can be combated. So much has been said in regard to tightening nuts, opening cotter keys, measuring piston travel, etc., that I thought we might pass that part of car maintenance tonight, assuming that it was being well taken care of, and go a little deeper, with a view of suggesting something constructive.

In order to properly analyze the present unsatisfactory condition of freight cars, it will be necessary to go back two or three years and ascertain what has occurred during that period that would contribute to the present situation. If this can be determined with any degree of accuracy, then we should be able to suggest something that will give us relief.

Effect of Pooled Equipment

Formerly it was common practice to maintain the majority of cars on home lines, but during the war the pooling of freight cars was deemed necessary, and cars on home rails in many instances were reduced to ten per cent of the equipment owned. It does not seem at present that we are going to get back to previous conditions in this respect for some time to come, if ever. The result has been, and still is, that a very large percentage of cars in bad order are of foreign ownership, for which the handling line does not carry in stock standard material, except a few M. C. B. parts. Therefore, in lieu of repairing in kind, improper and temporary repairs have been made in order to return the cars to service.

All railroads throughout the country have been repairing cars in this manner. It was the best they could do under existing conditions. Such methods are responsible in a very great measure for the condition of freight car equipment at this time.

A check and inspection of system cars received home at interchange points developed that a very large percentage were in need of extensive repairs and a large number had defects that could have been repaired by using standard material. This would seem to indicate that returning equipment to owners only when it has become unserviceable is being practiced to a very great extent.

Imagine what is going to happen with 75 per cent or more of all cars in the country on other than owning lines with conditions of this kind existing. I do not mean to say that there has been willful neglect on the part of railroads in general, but an analysis of the situation shows that these things have been forced upon them by the scarcity and mixing or pooling of equipment.

Repairs to cars have been retarded:

First, because the car department forces have not been familiar with the class of cars they have been required to repair and necessarily have consumed more time than was customary on home line equipment.

Second, it was formerly customary to manufacture parts for system cars in large numbers which were placed in stock and could be used as needed. They were made with standard patterns, formers, dies and other labor saving devices, at the minimum of time and expense, but with foreign cars in the majority on shop tracks this practice could not be continued, as there was not a sufficient number of system cars received to warrant the manufacture of various parts in any great amount. Practically all such parts for cars of foreign ownership require special operations through the manufacturing section of our shops, thereby losing the benefits of the labor saving devices that were previously in use. This has resulted not only in reducing the shop output, but has greatly increased the cost of production.

Old Cars the "Weakest Link"

Train tonnage is being increased from day to day; heavier locomotives are built with greater drawbar pull, and two or more are coupled together on heavy grades, or where it may be necessary to maintain fixed tonnage; heavy rails with rock ballast have been laid; new and stronger bridges have been constructed and all modern appliances for transportation have been adopted. The freight car from 15 to 20 years old is expected to take its place in this line of modern improvements and successfully perform service that is two or three times greater than was originally intended when the car was built. It is unreasonable to expect the old freight car to function efficiently against such odds.

If we were handling the same train tonnage with the same locomotives that were used when the cars that are failing were built less trouble would be experienced. The sooner railroads strengthen the weakest link in transportation, which is the car, the quicker results will be obtained. Many of these cars are of old and weak construction and their failure not only results in damage to themselves, but frequently causes serious damage to other good cars that are being handled with them. The majority of these cars are repaired in kind instead of being dismantled, as was formerly the practice.

Cars with short draft timbers, extending from end sills to body transoms, of which there are many thousands in service, cannot be handled with any degree of success with present transportation methods. Cars of this construction that have had new sills and ends applied and generally repaired, in many instances have them torn out and destroyed within a few miles of the shop where repairs were made. A number of railroads, however, have started to apply reinforcements, some of which are of substantial construction, while others are little improvement, if any, over repairing in kind, and seem to have been contrived to reduce the expense of application rather than to give service. The result of such a practice is, that the expense of upkeep, not considering service, will soon equal the cost of proper reinforcements and the weak cars will still be on your hands. This is false economy, and it would seem that the design of reinforcements for freight equipment is not being given the thought its importance deserves.

If this is true, and we all know it is, then surely something should be done to eliminate or prevent repairs of this character.

The labor situation has also contributed very largely to present conditions. Many of the old employees have worked faithfully and endeavored to produce an honest day's work, but as a whole they have not manifested the same interest or

*Presented before the Western Railway Club, Chicago, January 17, 1921.

given the same loyal support as was formerly their practice. There seems to have been a spirit of getting by with the least possible amount of work and indifference as to the quality as well.

Effect of Labor Conditions

The leveling of rates for all mechanics in the carmen's craft has reduced shop output instead of increasing the production, as was expected by some of the advocates of this system. All men are not of the same ability, and the highly skilled mechanic feels that he should not produce more than one of lesser skill because he is receiving the same rate of pay. This is human nature, and we cannot expect a change in these principles until a different method of compensation has been inaugurated.

Railroad shops are among the very few manufacturing plants throughout the country where all mechanics are placed in one class regardless of skill, and where the thrifty and industrious employee is supposed to produce a sufficient amount of work without extra compensation as compared with the man with a shiftless and lazy nature. Such a system is wrong, as it not only works an injustice and hardship upon the employee, but the employer as well. The right of every man to earn in accordance with his skill and ambition to produce, should not be denied him. It is one of the fundamentals upon which the Constitution of our country is based.

Rules and regulations that required years to work out and establish for the other crafts, were put into operation at once in car department forces, with the result that there was a lot of confusion which finally was adjusted with not enough men in the country with the experience required by the rules, to cover the work then on hand. There was no method of creating more until three years had elapsed, and then only through the helper apprentice system. The duties of carmen are so varied and cover so many distinct lines of work that rules which govern blacksmiths, machinists and some of the other crafts cannot be applied to carmen in so short a period and meet all of the various conditions of car work.

The rules insofar as they refer to supplying carmen are not workable because they have closed the door on increasing the number of men that can be employed at this work. On account of the centralizing of authority, the former close personal contact between the employee and those in charge has ceased to exist; supervisors are not free to settle questions that may come up from time to time, but must be governed by decisions handed down by men who are many hundred miles away and who perhaps never have been on the grounds and certainly are not familiar with the local conditions. Ability cannot be considered and is not a factor in promotion at this time. Seniority governs in all cases, at least to the extent of a trial, with the result that there are entirely too many trials and very little production in the meantime. All of these things and perhaps many others that could be mentioned have all had a tendency toward a general lowering of the employees' morale.

The effect of such a condition is reflected in the present condition of freight car equipment. These restrictions have affected shop operations to such an extent that it has been found impossible to maintain bad order cars within a reasonable percentage.

The Misuse of Equipment

We hear much in regard to speeding up and increasing efficiency in operation; that more cars must be loaded and carry a greater tonnage; that the miles per car per day should be increased. But those in charge seem to have lost sight of the fact that a great factor in bringing about these results is keeping the greatest possible number of cars in service, and that this in a great measure depends upon the manner in which they are handled. Very little, if any, attention or consideration is given to the misuse of equipment. The only thought seems to be of delivery and loading or unloading, and if damaging or mutilating the car would in any way assist in this operation, there is no hesitancy in doing so. It is not uncommon, however, to receive complaints about the large number of cars it becomes necessary to bad order after receiving usage of this nature.

These destructive methods have been gradually on the increase for the last two or three years, and have not been confined to hump and classification yards. At piers and wharves, and in fact, at all loading and unloading points, the abuse of cars is always in evidence. It has become almost impossible to maintain cross ties, brake staffs and wheels, where clamshell unloaders are in use, notwithstanding the fact that these must all be replaced before the car can be returned to service.

Roofs, doors, door tracks and fixtures, flooring, lining, and in fact any part of the car that might affect the unloading operation, are torn off and destroyed, apparently without the least thought of the important position the freight car holds in relation to moving the country's traffic.

Many thousands of cars are thus damaged and sent to shop tracks daily, which otherwise could be loaded again without repairs, not only reducing the cars out of service on account of bad order but greatly assisting in increasing car mileage and the number of cars loaded.

Material Shortage

While the material situation has improved during the last two or three months, it has contributed its share in full measure to the difficulties that have been experienced in properly maintaining cars in serviceable condition. Manufacturers have received orders in excess of their capacity to produce, and when finished, the scarcity of cars very often prevented prompt shipment of the material. This and embargoes placed on company material from time to time made proper and prompt repairs impossible even though other facilities were adequate.

With all of these conditions existing, is it any wonder that we find freight cars run down and worn out and need those in charge of car maintenance feel that they have fallen short in the performance of their duties? I believe you will all agree with me in stating that they have done well, all things considered.

What Are the Remedies?

The following suggestions will assist in relieving the present unsatisfactory condition of freight cars throughout the country.

When possible from a traffic standpoint, cars should be returned to owning lines where repairs can be made. The old and light constructed cars could then be dismantled or assigned to special home line service and those that warrant being continued in service should receive substantial reinforcements that would be in keeping with the service they are required to perform.

All railroads are under moral obligations to do this, because they expect such cars to be accepted and handled in through line traffic by other railroads. Under the present system of pooling equipment through Commission orders, etc., a railroad that builds and reinforces in line with good practice will receive very little benefit from so doing, unless all other roads do likewise, because the exchange of cars between railroads has increased to an extent that 75 per cent of equipment on line is of foreign ownership and cars that receive extensive repairs today will probably leave the home line tomorrow and not return for several years. Therefore, there should be some agency established between rail-

roads that will prevent the application of reinforcements or the perpetuating and offering of cars in interchange traffic that are unfit from a standpoint of strength for general service.

All railroads have had sufficient experience to indicate to them that cars with short draft arms extending from end sill to body bolster cannot be handled with any degree of success, especially on trunk lines in heavy tonnage trains, and after a reasonable length of time has been given, they should be refused in interchange regardless of type or capacity. A very large percentage of the present bad order equipment can be confined to approximately 400,000 cars in the United States. All that the majority of these cars need to make them serviceable for many years to come is the application of proper reinforcements.

If the pooling of cars is to continue and it becomes impossible to return them to home rails, then so far as it may be practical, certain common standards applicable to the most of this equipment should be adopted. These should be applied regardless of where the cars may be. This would not only hasten placing them in proper, serviceable condition, but would very materially assist in their future maintenance.

The General Committee of the mechanical division of the A. R. A. should appoint a committee for this purpose, and work out a system that would enable all railroads to reinforce such cars when placed on shop tracks for extensive repairs, regardless of ownership.

The condition of many cars received home shows that repairs for which standard material could have been used have not been made, indicating that cars of foreign ownership are not receiving the attention that present conditions would warrant or permit.

Under the present arrangement a railroad should, so far as possible, give the same consideration to foreign cars that it does to its own cars, and the failure to do so will react against the proper maintenance of freight equipment as a whole.

It has been stated that the writer is in favor of no labor unions and low wages, and that in saying so, he has voiced the sentiments of the "higher-ups." Nothing could be further from the facts. I believe in labor organizations that are conducted on just and moral principles, and that every man is entitled to fair and just treatment and his day in court. No superior of mine has ever suggested or even intimated to me what my views should be on this subject. Employees are entitled to safe and sanitary working conditions and regardless of the class of work a man performs, if he is willing to produce an honest day's work, he is entitled to a good living wage—by that I mean, enough for himself and family to live comfortably, to educate his children and, without extravagance, to lay away something besides. And treating this as a basis, every man should be paid according to his ability and willingness to produce. It is the only fair and just method of compensation, and a system that would make this possible should be inaugurated.

Rules that have been found to be unworkable and those that have inflicted unjust and unreasonable penalties on employers should be replaced with others that will equitably and fairly meet the conditions they are intended to cover. Men who are thoroughly familiar with their class of work should be placed in charge. They should understand human nature and the difficulties under which employees must at many times perform their work; men that will keep in close personal contact with those under their charge and who are quick to see and correct a wrong, regardless of where it may exist. No man feels satisfied to perform his duties from day to day without some recognition from his superior outside of the salary he may receive. Every faithful employee is entitled to this consideration. It not only creates a relationship of good will and loyalty, but inspires the employee to do better and more efficient work.

Supervisory officers of this type with proper authority ought to be able to meet and settle questions that may arise from time to time without the necessity of referring them to higher authority. If this is done, we should get back the morale and co-operation of our employees, which is very necessary in order to build up our production to a normal output.

So many cars are being damaged through carelessness, in many instances bordering on malice, that something should be done to prevent the destruction of company property by the misuse of equipment. I am somewhat at a loss for a proper and effective solution of this problem, but some sort of a campaign is necessary, because in many instances those in charge appear to give this very important question no more thought than the employees they supervise. Much money could be saved if it could be instilled in the minds of those handling them, including some transportation officers as well as dock foremen and yardmasters, that cars are constructed, not to be damaged and mutilated, but to perform a very important service in connection with the life of our nation.

In view of the fact that a very large percentage of the damage to freight cars is caused by shock, draft gear maintenance is worthy of serious consideration at this time. The question of type or style of gear must be left open for further tests and investigation, but I believe that we should get the best out of whatever type we have in service. They perform more work and receive harder usage than any other device on a car, and it is the only one for the inspection and maintenance of which there are no specific rules laid down.

The function of a draft gear is primarily to keep down the pressure in the car underframe when under impact, which is done by increasing the length of time the forces are distributed through the car during such impact—in other words, by draft gear travel. It should always be remembered that none of the forces resulting from impact or collision are destroyed, but all remain in the car underframe to be disposed of or dissipated in one way or the other. Any wear or broken part that causes slack, reducing the effective travel of the gear, hastens the closing point, after which the pressure in car sills or underframe increases very rapidly.

If the function of the draft gear is as important as I believe we will all admit, then surely some systematic method of inspection and repairs should be installed on all railroads. We find that this is necessary in the maintenance of air brakes, wheels, and couplers. The cost to make such inspection or adjustments would not necessarily be greater than the expense of cleaning and repairing the air brakes, which the law compels railroads to do at least once a year, and I feel sure that the saving would be many times greater than the cost.

A periodical inspection should be arranged for and the dates should be stenciled on the car in a manner similar to the present practice with respect to air brakes.

Discussion

The paper drew forth a discussion on a wide range of subjects pertaining to the maintenance of freight cars. Several speakers referred to the frequency with which draft gears and attachments and box car ends were damaged and the suggestion of the writer of the paper that standard repairs generally applicable to all old equipment be developed by the mechanical division of the American Railway Association was favorably received, particularly as to standard car ends and draft reinforcements.

Several speakers called attention to the extent to which old cars with wood draft arms extending only as far back as the body bolster are receiving extensive repairs, as much

as $1,200 being expended on heavy repairs to such cars, which are liable to fail immediately on being placed in service. Although the retirement of such cars was advocated several times during the discussion, it is evident that Rule 120 of the interchange rules has not accomplished its purpose.

C. N. Swanson (Atchison, Topeka & Santa Fe) strongly advocated fixing the A. R. A. prices for labor and material so high that owners would be forced to take proper care of their own equipment and that when cars are repaired on foreign lines the repairing road would be able to do the work at a profit.

C. J. Wymer (C. & E. I.) also advocated the policy of setting A. R. A. prices high enough to include a profit. In this connection Mr. Wymer also advocated making all defects owner's defects and balancing this with a rental charge high enough to reimburse the owner for the upkeep of the equipment.

The effect of the present condition of freight cars on operating costs was touched on by D. I. Bergin (Wabash), who stated that hot boxes and bad orders created enroute were prolific causes of excessive fuel consumption and crew overtime. He called attention to the fact that all a railroad has to offer in competition is the service it can render; weak equipment which causes delays in the movement of traffic seriously affects the quality of this service.

In closing, Mr. Fritts called attention to the 40-ton cars with short draft timbers, many of which are in service, as needing equally as much attention as the 30-ton cars frequently referred to in the discussion. These cars, from the very fact that they are permitted to carry heavier loads, may be even a greater menace than the similar cars of lighter capacity.

Plans for Helping New England Roads Considered

WASHINGTON, D. C.

HEARINGS on the application of the New England railroads for an order by the Interstate Commerce Commission giving to the lines east of the Hudson river large divisions of the through rates to and from New England were resumed at Washington on January 24. At the same time a renewed effort on the part of the commission to induce the railroads to reach an agreement among themselves which would make it unnecessary for the commission to prescribe the divisions made by Chairman Clark, who called to Washington for a conference the committee of executives representing the New England, the Trunk Line and the Central Freight Association roads which was appointed at the suggestion of the commission before the hearings were begun, to try to work out a basis for a voluntary agreement. Chairman Clark strongly urged upon the executives that they should settle this case themselves, pointing out that Congress and the commission have been trying to deal with the railroad problem in a broad way and that here was an opportunity for the railroads themselves to do something in a spirit of co-operation in the general interest. He also took the position that the railroads ought to be able to handle the matter in a practical way which would lead to more satisfactory results than a determination by the commission. Chairman Clark had made similar statements at an informal conference held to consider the New England situation on November 23 when the executives' committee was appointed to try to reach a solution without allowing the case on the formal complaint of the New England roads to come to trial. The committee held several meetings but failed to accomplish anything. The commission had also suggested that the railroads try to reach an agreement on divisions which would give some relief to the New England lines, in its decision in the general rate advance case, after the New England roads had suggested that they be placed in a rate district separate from the Eastern lines generally, because of their needs.

Commissioner Eastman also was present at the conference. After hearing Mr. Clark the executives conferred among themselves for an hour or more and then adjourned for another meeting at which it is understood that a plan was tentatively agreed upon which was to be put up to the trunk line executives at a meeting in New York early next week.

While members of the committee declined to talk for publication, it is reported that the committee agreed to recommend that the trunk lines give the New England roads about $15,000,000 a year. An offer of $12,000,000 had previously been made and refused and it is understood that the representatives of the New England roads have not definitely agreed to accept $15,000,000 but have shown more disposition to accept a compromise than they did when the lower figure was suggested. It is also understood that one of the plans proposed contemplated a voluntary assessment of a percentage of the freight earnings of the eastern roads outside of New England to constitute a pool which would be divided in some way among the New England lines without readjusting the divisions.

The New England lines have taken the position that the trunk lines received approximately $25,000,000 a year from the rate decision by the inclusion of the New England lines in the Eastern group, which was allowed a 40 per cent advance in freight rates. The trunk lines, while recognizing the needs of the New England carriers, have taken the position that they have made out a better case for an advance in their local rates than they have for increased divisions, also that the results of the rate advance to the Eastern lines were disappointing and that they cannot afford to give up any of their revenue to the New England roads. Some of the executives have taken the position that even if they were willing to do so they should not be asked voluntarily to give up money belonging to their stockholders without an order from the commission. It is understood that some sort of a pooling arrangement has been considered.

Robert C. Wright, general traffic manager of the Pennsylvania, was the first witness for the trunk lines when the hearing was resumed on Monday. Mr. Wright insisted that the New England roads had received generous treatment at the hands of the trunk lines in the fixing of divisions and he presented a series of exhibits to show that the New England lines receive a larger percentage of the through rates than if the divisions were fixed on a mileage proportion calculated by 50 mile blocks, with an allowance of 50 constructive miles for terminals. He said every traffic man east of the New England junctions has always considered the percentages high and he characterized the suggestion for a 15 per cent increase in the arbitraries accruing to the New England roads as a "hold-up." He was cross-examined by Charles F. Choate, counsel for the New England lines, who endeavored to bring out that the divisions, many of which were fixed 40 or 50 years ago, do not take into consideration the increase in terminal costs.

D. T. Lawrence, general freight agent of the Delaware, Lackawanna & Western, also cited many examples of the methods of fixing the divisions which accrue to the New England lines on traffic to and from his line. He said the New England roads are already getting much more than a mileage prorate and more than they should expect and that the Lackawanna for several years has been endeavoring to get better divisions from the New Haven.

Similar testimony was given by Henry Adams, general freight agent of the Erie; W. G. Story, general freight agent of the Delaware & Hudson; A. J. Anderson, general freight agent of the Baltimore & Ohio, and W. S. Kallman, assistant to the president of the New York Central.

Results of the Abolition of Piece Work Pay

The Hourly Rate in Railroad Shops Has Decreased Efficiency and Output and Increased Operating Costs

PAYING RAILWAY SHOP EMPLOYEES solely according to the number of hours worked, instead of on the piece work basis according to the class and amount of work done has resulted in greatly reducing the efficiency of the individual shop worker and consequently in increasing the number of men that must be employed, decreasing the possible output of the carriers' existing shop facilities and greatly increasing their expenses, according to the testimony which has been presented to the Railroad Labor Board on behalf of the railroads during the past week. Proof of this contention, in the form of detailed statistical studies, was presented to the board by representatives of several of the larger carriers. This evidence constitutes part of the railroads' presentation in opposition to the employees' demand for the continuation of national agreements, one of which, the shop crafts agreement, on which the Board has been holding hearings since January 10, prohibits paying shop employees on a piece work basis.

The decrease in the efficiency of the individual shop worker, after he began to be paid by the hour, varied between 10 and 50 per cent. The actual production of the shops cited in this testimony decreased from 5 to 30 per cent following the abolition of the piece work system of pay, in spite of the fact that more men were employed.

The progress of the hearings on national agreements has been reported in the *Railway Age* of January 10 (page 199) and of January 21 (page 243). On January 18, E. T. Whiter, chairman of the Conference Committee of Managers of the Association of Railway Executives, completed his presentation in opposition to the shop crafts agreement. The following day officers of the motive power and car departments of several of the larger trunk lines began the presentation of wage, time and production studies made in the shops of their respective lines. It is not practicable to present all of the testimony given but the following conclusions drawn from the various studies, indicate the manner in which the substitution of hourly rates of pay for piece work rates has affected the cost of maintaining equipment and consequently the amount necessary to pay operating expenses.

Some Chesapeake & Ohio Examples

The same freight car repairers doing the same work in the Huntington (W. Va.) shops of the Chesapeake & Ohio during the last four months of 1918—when they had a guaranteed hourly wage—did 41.4 per cent less work than in the corresponding period of 1917, when they were on an exclusively piece work basis. This was due to the fact that, although nominally piece work was continued, the hourly wage had been raised so high that the incentive to obtain a higher wage under the piece work rates was destroyed because of the slight difference between the guaranteed rate and the rate which might have been earned by increased efficiency.

At the Russell (Ky.) shops of the same road, freight car repairers—the same men doing the same work under the same piece work rates—did 35.3 per cent less work the last four months of 1918, when they were guaranteed an hourly minimum, than they did during the corresponding period of 1917.

Again, at the Silver Grove (Ky.) shops of the same road, the car repairers did 29.5 per cent less work than in the same period of the previous year.

During the same two periods air brake repairers employed by the Chesapeake & Ohio at Huntington and Silver Grove did respectively 32.4 per cent and 33.4 per cent less work on the guaranteed hourly basis than they did in the corresponding period of the previous year solely on piece work.

Similarly, passenger car painters at Huntington did 25.07 per cent less and engine painters 15.33 per cent less per hour than they had when the difference between the hourly rates and the piece work rates was such as to provide an incentive to increase production.

Chesapeake & Ohio employees in the brass foundry at Huntington, during the months of March, April, May, June, July and August, 1917, under piece work rates earned an average of 45.15 cents per hour. If the same piece work rate had been applied to the work done by the same men in the corresponding period of 1920, after the guaranteed hourly rate was established, they would have earned an average hourly rate of but 40.27 cents. This represented a decrease in efficiency of 10.8 per cent due entirely to the substitution of the hourly basis of pay for the piece work basis of pay.

During the months of April, May, June, July and August, 1917, employees in the Huntington brass foundry bored 3,016 car brasses during each 48-hour period, or one brass per minute under the piece work rates. At present the same employees are boring but 2,996 car brasses during each 52 hours, taking one and a half minutes for each operation. This represents an increase of 50 per cent in the time required to perform this particular operation by the same men working under hourly rates over the time required when the same men were working under piece rates.

The average number of man hours (a man hour is equivalent to one man working one hour) required to paint a passenger car in 1917 under piece work rates was 237.04. At the present time the average number of man hours required to paint a car has increased to 264.93, or an average increase per car of 27.89 man hours.

In the Chesapeake & Ohio's tin shop at Huntington during the months of April, May, June, July and August, 1917, under piece work rates, 94 7-in. smoke jackets were manufactured in 52 hours, or at the rate of 33 minutes per piece.

During the same period in 1920, under the hourly rate, it took 85 hours to manufacture 96 similar smoke jackets, or at the rate of 53 minutes per piece. The percentage of increase in the time required for this particular operation over 1917 is 60.6 per cent.

During the months of April, May, June, July and August, 1917, the average number of wheels bored per hour in the wheel rooms of the Chesapeake & Ohio's Huntington shops was 8.78. During the same period of 1920 the efficiency of the individual workers had so declined that but 4.65 wheels were bored each hour, a decrease of 47 per cent in the shop's production.

Time Required Increased 6.7 to 200 Per Cent on B.&O.

The time required to perform certain operations in the locomotive erecting shop and foundry of the Baltimore & Ohio at Newark, Ohio, and in the shops at Baltimore, Md., increased by from 6.7 per cent to 200 per cent after the piece work system of pay was abolished and the hourly wage system substituted. Of 52 operations in these shops not one requires the same or less time than was required under piece work rates.

In the Union Pacific's main shops at Omaha, Neb., and Denver, Colo., comparing periods when piece work rates were

in effect with periods when hourly rates were in effect, the total average increase in man hours—representing the longer time required to perform the same operations—was 36 per cent. Simultaneously the output at these shops decreased 26.5 per cent. This represents in general the detrimental effect of the change from the piece work basis of pay to the hourly basis.

Union Pacific

The man hours in the Union Pacific's boiler shop at Omaha have increased 31.4 per cent while the output has decreased 23.9 per cent; the man hours in the blacksmith shop at Omaha have increased 35.5 per cent while the output has decreased 26.2 per cent; the man hours in the wheel shop at Omaha have increased 31.9 per cent while the output has decreased 24.2 per cent; the man hours in the wheel shop at Denver have increased 40.5 per cent while the output has decreased 28.6 per cent; the man hours in the paint shop at Omaha have increased 42.4 per cent while the output has decreased 29.8 per cent; the man hours in the passenger repair shop at Omaha have increased 32.5 per cent while the output has decreased 24.6 per cent; the man hours in the freight car repair shop at Omaha have increased 26.4 per cent while the output has decreased 20.9 per cent; and the man hours in the coach cleaning yard at Denver have increased 38.6 per cent while the output has decreased 27.9 per cent.

Decreased Efficiency in New York Central Shops

Comparing a seven months' period in 1917 in which locomotive repairmen were paid by the piece with similar periods in 1918 and 1919 when they were paid by the hour, it was found that in the locomotive repair shops of the New York Central the man hours in 1919 increased 26 per cent over 1917 whereas the actual number of engines repaired decreased 11.9 per cent. Again, in 1920 the man hours increased 52.9 per cent over 1917, but despite this large increase the number of engines repaired increased but 13.7 per cent. Comparing similar periods in 1919 and 1918, the man hours were increased 5.9 per cent while the production decreased 26.6 per cent. Again, comparing 1920 with 1918 the man hours increased 28.6 per cent and production decreased.

The average total number of hours spent in repairing a locomotive in 1917 on the New York Central was 2,185 hours and in 1918, 2,165 hours. This was under the piece work basis of pay. In 1919 under the hourly system of pay the average total number of hours expended upon the repair of a locomotive had increased to 3,129 hours. In 1920 the average was 2,938 hours. This increase in the number of hours spent on repairing a locomotive, 30 per cent in 1919 and 26 per cent in 1920, is due wholly to the decreased efficiency of the individual locomotive repairmen, which is due to the absence of an incentive to work efficiently.

When piece work rates were paid on the New York Central a pump was repaired in 4 hours and 50 minutes. Now that the shopmen are paid solely by the hour it takes the same men 11 hours to repair a pump. Similarly, when piece work rates prevailed, a driving box was bored and faced in 46 minutes; now under hourly rates it takes 1 hour and 25 minutes to perform the same operation.

The Pennsylvania's Experience

On July 25, 1918, shop employees were granted an hourly guarantee which was near the average hourly wage which the efficient piece workers had been making. This resulted in an immediate drop in the productiveness of the piece work repairmen. For instance, on the Pennsylvania 3,159 car repairers employed from July 1 to July 15, 1918, earned under the piece work rates $0.501 per hour. From August 1 to August 15, 1918, the same men did only enough work to have earned $0.443 per hour under the same piece rates. In other words their efficiency in terms of output per hour, decreased 11.6 per cent when the basis of pay was changed. During the period from January 15 to January 31, 1919, their efficiency had further decreased to 26.7 per cent below the period from July 1 to July 15, 1918.

The average earnings under piece work rates of car repairmen on the eastern lines of the Pennsylvania from August 31, 1917, to July 31, 1918, was $0.48 per hour. From August 1, 1918, to January 31, 1919, these men, paid on the guaranteed hourly basis, performed only sufficient work to have earned $.372 per hour at piece work. In other words, the average individual efficiency, as shown by the hourly output, decreased 22.5 per cent after the abolition of the piece work.

Computed in a similar manner the average efficiency of air brake repairers employed by the Pennsylvania decreased 7.4 per cent in the period from August 1 to 15, 1918, and 23.2 per cent in the period from January 15 to 31, 1919, as compared with their efficiency from July 1 to 15, 1918.

The efficiency of the locomotive repairmen employed by the Pennsylvania at its shops at Renovo, Trenton, Wilmington, Altoona, Columbus, Terre Haute, Olean, Verona, South Pittsburgh, and Fort Wayne has decreased 35 per cent on the basis of their average hourly output before and after the substitution of the hourly basis of pay. Where their average earnings under the piece work rates were $0.524, they would now earn under the same rates but $0.341.

Likewise the efficiency of molders in the Pennsylvania's South Altoona foundry has decreased 14.1 per cent. In August, 1918, under piece work rates they actually earned $0.616. If they had been paid the same rates in August, 1920, they would have earned but $0.529.

Norfolk & Western Car Repairers

Freight car repairers on the Norfolk & Western have so decreased in productive efficiency that the number of cars repaired per employee decreased 43 per cent in the last six months of 1919 as compared with the corresponding period of 1917. During this period in 1917, 92.9 man hours were expended for each car repaired. During the corresponding period of 1919, 163.1 man hours were expended per car.

Other Roads

As a result of the abolition of piece work the efficiency of the freight car repairers of the Chicago & North Western has decreased 35.6 per cent per hour. Similarly the efficiency of passenger car repairers per hour had decreased from 20 to 40 per cent, of cabinet workers from 20 to 23 per cent, of planing mill workers from 27 to 29 and of blacksmiths 44.

The efficiency of individual mechanics on the Chicago, Burlington & Quincy as indicated by their output decreased from 36.2 to 46.7 per cent after they were paid by the hour instead of by the piece. The efficiency of mechanics in the West Burlington, Iowa, shops decreased 36.2 per cent, that of mechanics in the Hannibal, Missouri, shops 46.7 per cent, of locomotive mechanics in the Aurora, Illinois, shops 37.1 per cent, of mechanics in the Havelock, Nebraska, shops 46.4 per cent and of blacksmiths and boilers makers 39.7 per cent.

The Louisville & Nashville

Following the abolition of piece work in the shops of the Louisville & Nashville the time required to manufacture certain articles increased from 6.7 to 50 per cent. For example, under the piece work system of wages an iron slab was made in 10 minutes. Under the hourly basis of pay, on the other hand, it took 15 minutes to make the same slab, an increase of 50 per cent. Likewise, under the piece work system, iron axles were made in 45 minutes, while after wages were put on the hourly basis the same work required 60 minutes, an increase of 33.3 per cent in the time required.

Besides the railroads mentioned, testimony showing similar reductions in the output of workmen, due to the abolition of piece work, has been given for the Chesapeake & Ohio, the

Union Pacific, the New York Central, the Baltimore & Ohio and the Norfolk & Western. This testimony regarding conditions in the shops of railways in every section of the country shows a reduction in the productive efficiency of employees, due to the abolition of piece work, of from 10 to 50 per cent.

The specific examples cited are but a few picked at random from the volumes of statistical studies presented to the Board. However, they show in general the effect that has been produced by the action of Director General McAdoo and the Railroad Administration in abolishing the piece work method of fixing employees' compensation and substituting therefor the hourly wage regardless of the class and work done.

The Chesapeake & Ohio presentation was made by E. V. Ratcliff, general car foreman; the Union Pacific by W. I. Langford, assistant general time and work inspector; the New York Central by W. L. Hazzard, supervisor of the routing system, and E. J. Thill, assistant to the general superintendent of rolling stock; the Pennsylvania by A. C. Davis, superintendent of motive power, and R. L. Kleine, assistant chief of motive power (car); the Norfolk & Western by J. M. Thomas, mechanical inspector; the Baltimore & Ohio by E. P. Poole, supervisor of shops, and F. H. Lee, supervisor of freight car maintenance; and the Chicago & North Western by G. E. Collins, supervisor of car repairs.

Following the completion of testimony regarding the detrimental effects of the abolition of the piece work system of pay, Mr. Whiter resumed his presentation on behalf of the carriers, taking up the agreement made during federal control with the maintenance of way employees. This testimony will be outlined in the next issue of the *Railway Age*.

Annual Meeting of the American Society of Civil Engineers

THE SIXTY-EIGHTH ANNUAL MEETING of the American Society of Civil Engineers was held on January 19 and 20 at the headquarters of that society at 33 West Thirty-Ninth street, New York. Of the business before the meeting the annual election of the officers for 1921 held the interest and attention of the members most, for an opposition or second ticket had been nominated and presented. The results of the election gave a majority to the original ticket out of a total vote counted of 7,008. The officers elected and the votes cast for them are as follows: President, George S. Webster, Philadelphia, Pa., 4,036; vice-presidents, Andrew M. Hunt, New York, 3,947, and Edward E. Wall, St. Louis, Mo., 4,003; treasurer, O. E. Hovey, New York, 4,093; for directors, Dist. 1, J. P. Hogan, 6,243, and Ira W. McConnell, New York, 4,052; Dist. 4, R. L. Humphrey, Philadelphia, Pa., 4,001; Dist. 9, B. L. Brown, St. Louis, Mo., 3,883; Dist. 10, F. T. Darrow, Lincoln, Neb., 6.689, and Dist. 11, G. G. Anderson, Los Angeles, Cal., 4,046.

The committee on Stresses in Track presented only a progress report stating that the committee had been engaged in a series of tests, experiments, etc., on the effect of curvature on the stress in the rail as compared with tangents. Though the greater part of the work had been done, the data as yet had not been collected and worked up in its final form. The work has been conducted chiefly on the Illinois Central, the Lackawanna and the Santa Fe, using various types of engines and varying degrees of track curvature. Other special committees also presented reports varying in degree from work just started to work ready for release.

The question of external relations was discussed to some extent, the general opinion being that in the future the board of direction should act as a committee on this question, appointing local chairmen and committees throughout the various districts in order to coordinate the work properly and without undue expense. Under this arrangement the board will keep in close touch with other organizations, as, for instance, the Federated American Engineering Societies, keeping itself informed as to any work under way of interest to engineers as a whole or to the society.

The committee on amendments reported that the amendments under consideration were similar to those defeated previously and recommended the ones under consideration be sent out with an adverse report. It was voted that still more recent amendments also on similar lines be referred to this committee and that they be sent out to letter ballot with an adverse report.

How the Interstate Commerce Commission Fixed the Valuation

WASHINGTON, D. C.

THE METHODS by which the Interstate Commerce Commission arrived at the figure of $18,900,000,000 as the aggregate value of the railroad property of the United States for the purposes of the 1920 general rate advance case were outlined by Chairman Clark of the Interstate Commerce Commission in connection with his testimony last week before the Senate committee on manufactures, which is holding hearings on a bill to regulate the coal industry.

"Stocks and bonds were not considered at all," said Mr. Clark in reply to questions. "The question of capitalization was not thought of. It is the fair value as closely as could be estimated and approximated at that time of the physical property which was devoted to the transportation service. We had a mass of information gathered in our valuation work, which is not in complete form to be given out in the form of reports and findings, and the transportation act specifically authorized us to avail ourselves of that information. We availed ourselves of all the information we could."

"Does that $18,900,000,000 include the percentage arising from the increase in the value of materials and property in recent years, since the roads were constructed?" asked Senator Jones of New Mexico.

"No, it does not attempt to equate the values," said Mr. Clark. "The principal figures that we used in our value are as of 1913 and 1914. We fixed the price units on a given railroad valuation as of June 30, 1914. Those price units we think were accurate, and they were based on experience of a series of years in the past up to that date, and the prices then prevailing, for the determination of what was up to that time the normal price for fixing the value of a box car, a piece of track or anything else. If, on a given railroad, we had made our figures on the basis of the valuation established, say, of June 30, 1913, we then computed the value of what the railroad had at that time. All that had been put in since that time, added, has been computed on its cost."

"Then the valuation which you have put upon the railroads is based more largely on cost than on present value, is it not?" asked Senator Jones of New Mexico.

"Yes, sir," replied Mr. Clark. "It is based on three different values that we determined. First, the cost of reproduction as of the date of valuation, then upon the cost of reproduction less depreciation, which represents the depreciated condition of the property as of that date, and then the actual cost to date."

Commissioner Clark said that it would be idle to talk of making rates that would yield a return of 5½ or 6 per cent on a valuation of $40,000,000,000 because the traffic would not bear such rates. If the value of the roads in 1915 had been $20,000,000,000 and prices increased 100 per cent between that date and 1920, the value on the roads would be $40,000,000,000.

"We did not have any mathematical rule in getting the valuation," he added. "We made every human effort by investigating carefully through a series of years prior to 1914 to arrive at a fair, normal value in normal times."

General News Department

The thirty-fifth annual meeting of the Engineering Institute of Canada will be held in Toronto on February 1, 2 and 3.

The Chicago, Milwaukee & St. Paul has posted framed notices in stations on its system advocating the "ship now" policy. The public is advised that for the first time in five years the railroads are able to handle more freight than is offered.

The directors of the American Railway Association have denied the request, presented by certain railroads, that action be taken looking to the temporary reduction (or even suspension), of the charge of one dollar per car per day for freight cars interchanged.

The rate of premium to be used in computing freight bills when paid in Canada on shipments to or from the United States has been fixed by the Canadian Board of Railway Commissioners, for the first half of February at 13.75 per cent, and the surcharge on freight bills will be 8 per cent.

The Signal Section of the American Railway Association will hold no meeting in March. This decision was reached by the directors of the association last week. For the annual meeting of the section, the date has been tentatively fixed for Monday, June 6, the meeting to continue through three days.

The Senate Committee on interstate commerce has held several meetings to consider the Frelinghuysen bill, which is a substitute for Section 10 of the Clayton law, and it was expected to order a favorable report on Thursday on the bill as amended in accordance with the suggestions made by the Interstate Commerce Commission. Chairman Clark has conferred with the committee and it has also considered some suggestions made by Senator Cummins.

The House Committee on interstate and foreign commerce has submitted a favorable report on the bill introduced by Representative Winslow to specifically authorize the Secretary of the Treasury to honor certificates of the Interstate Commerce Commission for partial payments to the railroads on account of their guaranty for the six-months' period following the termination of federal control. A minority report was filed by Representative Sims.

The Veteran Employees' Association of the Philadelphia & Reading held its thirteenth annual banquet at Philadelphia on Saturday evening, January 22, about 1,400 members being present. This association, composed of employees who have been in the service 25 years, now numbers about 1,900 members. The president for the ensuing year is W. U. Barr, assistant trainmaster at Reading. The retiring president, H. S. Fisher, was presented with a grandfather's clock.

The United States Civil Service Commission advertises for candidates for the position of chief statistician for the United States Railroad Labor Board, Chicago; also for a schedule expert, class A, and a schedule expert, class B, for the same board, the salaries for the three places being respectively $4,300, $4,200 and $3,600. Applicants must be between 25 and 60 years of age and must have had extensive experience in work on railroad wage schedules. Applications will be received until March 1.

Alaska, its geography and resources, with particular relation to the influence of the government railway, now nearing completion, was the subject of an address presented before the Western Society of Engineers at Chicago on January 20 by Colonel Frederick Mears, chairman and chief engineer of the Alaskan Engineering Commission, which is responsible for the construction of the railway. The talk was illustrated by slides and motion pictures illustrating the mining and agricultural developments, and also the progress in the construction of the railway. The views also brought out the physical features of the country through which the railroad is being built and indicated the wide variety of engineering problems encountered.

The Pennsylvania will not coerce any of its employees to join, or not to join, against their will, any organization whatever. This is the salient point in a bulletin which has been posted by General W. W. Atterbury, vice-president in charge of operation, because of communications received by some of the employees in certain departments to the effect that the road proposes to reduce the rates of pay of all employees who are not members of a labor organization and that those who desire to retain their present rate of pay must join labor organizations. "If anyone tells you that your present rate of pay depends on membership in a labor organization, or that the company proposes to pay a different rate to members and non-members, *deny it,*" says the bulletin. The employee's present position with its rate of pay or the exercising of seniority rights in no manner depends on membership or non-membership in any association or organization.

Prices to Be Printed on Pennsylvania Railroad Tickets

Printing the price on the face of tickets is now the regular practice on the Pennsylvania Railroad, and as fast as the present supply of tickets is exhausted, new tickets will show the amount of the fare. One of the first of the new forms is for transportation between Elmira, N. Y., and Altoona, Pa. At the bottom of each ticket is printed, "(Fare, $6.08; War Tax, $0.49)." Where necessary, because of changes in tariffs, the tickets on hand will be stamped with the new price, and agents will be instructed to show passengers the tariffs in the event that the new charge is questioned.

Robbers Increasingly Bold

Automobile bandits held up an automobile coming up-town from the Union Station at Toledo, Ohio, at noon on January 17, and seized $10,000 in ticket office receipts belonging to the New York Central. Two railroad patrolmen who resisted the highwaymen were killed and the robbers escaped with the money.

At Chicago, about two o'clock on the morning of January 18, four robbers held up railway employees and two post office men who were unloading a mail truck at the Union Station, and carried off a wagonload of mail. Holding these men at the point of their guns, the robbers entered the truck, seized registered mail sacks, deposited them in a waiting automobile, and got away. Numbers of persons witnessed the transfer of the bags, not realizing that it was a robbery.

The June Conventions

The Railway Supply Manufacturers' Association on January 10 sent out its official circular No. 1 extending the invitation to railway supply concerns to exhibit at the Atlantic City conventions in June. The date of the convention of the American Railroad Association, Division V—Mechanical, is June 15 to 22, American Railroad Association, Division VI—Purchases and Stores, will meet June 20-22. The circular gives the preliminary details concerning the exhibit and with it were enclosed space diagrams and forms for application for space. It is noted that the space will be assigned by the exhibit committee at the office of the Railway Supply Manufacturers at Pittsburgh on March 1.

The circular says: "Our annual convention in June, 1920, as generally known, was unusually successful and from the interest shown at this early date, it is expected to have even

a more successful convention this year, and with that in view a greater area of exhibit space has been provided. It is suggested that applicants for exhibit space request the minimum amount of square feet to meet their actual needs."

The address of J. D. Conway, secretary of the Railway Supply Manufacturers' Association, is 1841 Oliver building, Pittsburgh.

Railway Revenues and Expenses for November

The Interstate Commerce Commission has issued the following summary of revenues and expenses for 187 Class I roads and 15 switching and terminal companies for November:

Item	November 1920	November 1919	Eleven Months 1920	Eleven Months 1919
1. Average number of miles operated	235,594.87	234,405.51	235,251.49	234,194.41
Revenues:				
2. Freight	$437,007,964	$303,489,474	$3,937,234,790	$3,251,802,951
3. Passenger	106,829,660	92,475,222	1,173,385,680	1,079,654,919
4. Mail	8,536,089	4,283,363	141,383,863	47,731,158
5. Express	10,890,721	14,758,277	133,826,976	111,633,334
6. All other transportation	15,622.527	10,843,071	144,619,234	115,258,063
7. Incidental	12,740,573	11,855,109	136,934,898	118,560,811
8. Joint facility—Cr	720,406	585,975	7,092,838	6,266,333
9. Joint facility—Dr	217,222	185,274	2,103,904	1,968,276
10. Railway operating revenues	592,130,728	438,105,217	5,672,374,375	4,728,939,293
Expenses:				
11. Maintenance of way and structures	81,358,609	66,670,888	961,624,407	713,997,432
12. Maintenance of equipment	139,203,191	112.211,521	1,443,448,099	1,115,488,463
13. Traffic	6,197,612	4,000,139	66,081,139	42,872,861
14. Transportation	263,306,365	192,403,904	2,639,757,880	1,978,245,455
15. Miscellaneous operations	5,017,852	4,378,915	56,480,320	44,021,073
16. General	15,524,873	10,706,520	154,791,261	114,152,097
17. Transportation for investment—Cr	707,150	480,937	4,778,401	5,424,304
18. Railway operating expenses	510,501,352	389,890,950	5,317,404,705	4,003,353,077
19. Net revenue from railway operations	81,629,376	48,214,267	354,969,670	725,586,216
20. Railway tax accruals	22,561,753	18,679,783	250,922,303	177,450,924
21. Uncollectible railway revenues	56,668	143,505	925.207	809,861
22. Railway operating income	59,010,955	29,390,979	103,122,160	547,325,431
23. Equipment rents (Dr. bal.)	3,427,515	5,959,762	30,644,809	30,849,928
24. Joint facility rent (Dr. bal.)	1,239,647	1,405,410	17,242,682	13,984,006
25. Net of items 22, 23 and 24	54,243,793	22,025,807	55,234,669	502,491,497
26. Ratio of operating expenses to operating revenues, %		88.99	93.74	84.66

NOTE: (a) Federal lap-over items settled during the month are included in the above compilations for those roads that have indicated that estimates were not included for substantially all unaudited corporate items.
(b) The amount of war taxes included in November, 1920, is $2,033,600 and for period, March to November, 1920, $28,380,348.
(c) Report of the Duluth, Winnipeg & Pacific Ry. Co. not received.
c Credit item. *d* Debit item.

Employees' Service and Compensation for First Quarter of 1920

The Interstate Commerce Commission has issued a statistical summary giving the number of employees in service, the number of hours or days worked, the total compensation and the average compensation per day or hour for Class I roads for the first three months of 1920. This represents the effect of the wages in effect at the time of the award made by the Railroad Labor Board in July. For January the number of employees in service at the middle of the month was 2,000,105, for February 1,970,525 and for March 2,009,948, making an average for the quarter of 1,993,524. The total compensation for the quarter was $795,616,330.

For enginemen and trainmen the summary gives the number of hours on duty, the miles run and the average compensation per mile.

The Tie Supply of the Future

"The Tie Supply of the Future" was the subject of an address given before the Western Society of Engineers on Friday evening, January 14, by John Foley, forester, Pennsylvania System. This meeting constituted the initial step in the tour being made by the members of the American Wood-Preservers' Association on their way to the convention of that association, which will be held in San Francisco on January 25, 26 and 27. The meeting was attended by a considerable number of the members of this association. Mr. Foley's paper covered the relation of timber supply to timber consumption and voiced the opinion that while great inroads have been made in the original forest resources in this country, the perpetuation of reasonable timber supplies is a matter of conservative and prudent use rather than the development of substitutes. Following this line of thought he pointed to opportunities for development in timber preservation and in the care, use and purchase of ties by the railroads.

Railroad Retrenchment

The Erie Railroad, on January 22, issued a general order for reductions in the operating forces similar to that of the Pennsylvania which was noted in our last issue. The Erie order says that as far as possible forces shall be worked five days a week except where the safety of property may necessitate an exception to the rule. This is done with a view to meeting the situation in a more humane way than to lay off large numbers of employees.

The Baltimore & Ohio has furloughed between 7,000 and 8,000 shopmen with the expectation, however, that the suspension of work will not be of long duration.

The Pennsylvania this week has discontinued 15 long-distance trains which have been run exclusively for express matter, and 18 local passenger trains to and from Pittsburgh. At Northumberland, Pa., suspension of work on this road last Sunday was almost complete, passenger trains and freights carrying perishable goods being the only ones attended to.

The Lehigh Valley has reduced by about 16 per cent the forces in its shops at Sayre, Pa., and the men who work will report only five days a week.

The Norfolk & Western has laid off about 2,000 employees, mostly shopmen.

The Louisville & Nashville has suspended the movement of coal from mines on the Owensboro & Nashville branch with which it has fuel contracts, and consequently seven mines in this district have laid off about 800 miners.

I. C. C. Getting Data as to Cost of Repairs in Outside Shops

The Interstate Commerce Commission has sent to all carriers a questionnaire on which the railroads are required to furnish detailed information by March 1 regarding all their contracts for the construction and repair of cars and locomotives in outside shops since March 1, 1920, for the use of the commission in connection with its investigation which was instigated by the charges made by the machinists' union that the railroads have been paying excessive prices for work done in outside shops. The infor-

mation called for by the commission includes the terms of the contracts, the cost in outside shops in comparison with what it would have been if the work had been done in railroad shops, whether the costs shown include an allowance for supervision, depreciation, interest on investment and other overhead expenses, the proportion of the number of cars repaired under contract in outside shops, specific information as to the conditions which required the company to have repairs made at outside shops, a statement as to whether the facilities of the railroad plants had been utilized to full capacity, and the average number of men employed in the car departments each month. The questionnaire states that the commission is desirous of securing full information regarding these matters as well as the reasons actuating carriers in entering into these arrangements and the benefits to be derived therefrom.

Prizes for Reducing the Accident Record

The Chicago Great Western is to award prizes to the divisions of the road making the best record in its accident prevention campaign. Two banners, a flag and a silver cup will be presented for the best performances in 1921, on the following basis:

(1) To the division having the lowest number of reportable train and train service casualties per 100,000 engine miles, a banner.
(2) To the division having the lowest number of reportable industrial casualties per 1,000,000 man hours (excluding shop accidents), a banner.
(3) To the division having the lowest number of reportable casualties per 1,000,000 man hours in shop accidents (Oelwein shop to rate as a division), a flag.
(4) To the division (excluding Oelwein terminal and shop) having the lowest number of days lost per 1,000 man hours, due to all classes of reportable casualties, a silver cup.

The records are to be kept and prizes awarded by a committee selected by the general safety committee; and each month the committee will issue a bulletin announcing the standing of the contestants.

Forest Products Section to Be Formed by American Society of Mechanical Engineers

Mechanical engineers interested in the engineering branches of forest products, and organizations and individuals in the woodworking industries have begun a movement to establish a Forest Products Section of the American Society of Mechanical Engineers.

The consideration of various aspects of the woodworking industry especially in relation to the engineering applications of wood and to engineering methods of preparing wood for use in the industries at the symposium held at the recent convention of the society in New York focused the attention of prominent members of the society on the value a Forest Products Section would be to the woodworking industries.

The society's Committee on Professional Sections, which supervises such professional groups developed within the main organization, has looked with favor upon the establishment of the section, and it is planned to make it available as soon as possible.

Plans for Engineering Convention and Exhibit at Chicago Nearing Completion

While the signal division of the American Railway Association has decided to abandon its one day stated meeting in Chicago on March 14, no changes will be effected in the arrangements for the convention of the American Railway Engineering Association at the Congress hotel on March 15-17, inclusive, and for the simultaneous exhibit of the National Railway Appliances Association at the Coliseum. With reports of practically all committees of the A. R. E. A. in the hands of the secretary, the bulletins of technical information to be presented at the March convention will soon be sent to the members for study. C. W. Kelly, secretary of the National Railway Appliances Association, reports that 5,500 square feet of additional space has been made available for the exhibits this year and that all but 12 spaces of the total display area available have been contracted for by the members of the association. In view of the number of applicants for the remaining space it is anticipated that the entire exhibit area will be taken up within the next week.

Traffic News

The Royal Mail Steam Packet Company is going to give a monthly service from Vancouver, B. C., and the Pacific coast to Europe, and will use ships fitted with 3,000 tons of space refrigerated.

An increasing movement of grain has been noted on several western roads within the past few weeks. Pressure by the banks has compelled the liquidation of grain by the farmers, and the resulting movement has caused a demand for grain cars. The Burlington and the Chicago, Milwaukee & St. Paul report that while a large surplus of other equipment exists, there is an actual shortage of grain cars.

The Dominion Express Company, which operates on the lines of the Canadian Pacific, announces that in conjunction with Aircraft Transport and Travel, Limited, it has inaugurated a continental aerial service, twice daily between London and Paris and daily between London and Amsterdam. The fare charged on both lines is £10 10s. single, or £18 18s. return, including motor car service at both ends. Parcels are taken at the following rates: Shipments up to 10 lb. 2s. per lb., over 100 lb. 1s. 3d. per lb. The express company has arranged for this service a special insurance —life and accident—to cover risks up to £5,000. Parcels for Canada from Paris can leave Paris by airplane a day before the steamer leaves Liverpool.

Coal Production

Production of soft coal continued to decline during the week ended January 15, according to the weekly bulletin of the Geological Survey. The total production is estimated at 9,937,000 tons. The bulletin says that labor and car supply were sufficient and the chief factor limiting output was lack of orders.

Anthracite Shipments in December

The shipments of anthracite in December, as reported to the Anthracite Bureau of Information, amounted to 6,436,320 gross tons, against 5,765,347 tons in November, an increase of 670,973 tons; 24 working days; average daily shipment, 268,180 tons; November daily average, 274,540 tons, with 21 days worked.

Shipments by originating carriers were as follows:

	December, 1920	November, 1920
Philadelphia & Reading	1,324,004	1,238,994
Lehigh Valley	1,161,305	1,002,329
Central of New Jersey	497,735	453,139
Delaware, Lackawanna & Western	940,515	792,157
Delaware & Hudson	896,475	814,167
Pennsylvania	457,242	424,745
New York, Ontario & Western	164,557	175,074
Erie	675,979	603,766
Lehigh & N. E.	318,508	260,976
Total	6,436,320	5,765,347

"Building Demand Accumulates"

The Universal Portland Cement Company has issued a circular entitled, "Building Demand Accumulates," which cautions users of cement against waiting to come into the market when transportation demands are at a maximum. Attention is called to the fact that the supplying of this product is not a question of manufacturing capacity, but of the available car supply and general business conditions. Thus the most cement ever used in the country in any year was about 94 million barrels, in 1916, or approximately 470,000 carloads; on the other hand, a conservative estimate of the productive yearly capacity for all cement mills in the country is 125 million barrels, or approximately 625,000 carloads. "If everybody wants cement," the circular goes on to say, "and the farmer turns loose his grain, and business in general quickens, all at the same time, a lot of people are going to be disappointed by delays in their work."

Commission and Court News

Interstate Commerce Commission

The commission has issued its decision in the Iowa and Montana passenger rate cases ordering the railroads to increase their intrastate fares and charges by the amount of the increase applied on interstate traffic. The commission has also issued a decision ordering increases in the passenger and baggage charges and the rates on milk and cream applicable between points in Ohio by the amount of the increases applied to interstate traffic.

The commission has denied the motions for a reconsideration and reargument on the application for a consolidation of the express companies, which was recently authorized by the Interstate Commerce Commission. The motions were filed by John E. Benton, general solicitor of the National Association of Railway & Utilities Commissioners, and Charles E. Cotterill, representing the Southern Traffic League.

State Commissions

In the Federal Court at Detroit, Mich., on January 24, at the suit of thirteen railroads, the Michigan Public Utilities Commission was permanently enjoined from reducing railroad passenger fares below three cents a mile.

Suit was filed in the United States District Court at Chicago on January 26 by E. J. Brundage, attorney-general of Illinois, to have an order issued by the Interstate Commerce Commission giving Illinois railroads permission to advance passenger rates to 3.6 cents a mile, set aside on grounds of unconstitutionality of certain provisions of the Esch-Cummins Law. The suit seeks to determine whether the Commission has power under the Esch-Cummins Law to advance fares in Illinois.

The order of the New Jersey Board of Public Utilities, requiring the Erie Railroad to eliminate fifteen grade crossings in Paterson, has been held valid by the Supreme Court of the United States. The order of the board affected also "any telegraph, telephone, gas, electricity, water and other property," which would have to be altered as a result of the elimination of the crossings. The Passaic Water Company, Western Union Telegraph Company, the Public Service Railway Company and several private concerns joined with the railroad in appeals from lower court decisions, which decisions are now sustained.

Court News

Securing Railroad Employment by Fraud, Bars Recovery for Injury

In a recent action by a brakeman for personal injury, a special plea of the railroad company presented, as Judge Dayton of the federal district court for the Northern District of West Virginia said, such an extraordinary statement of facts as to render the legal questions involved in the plaintiff's motion to strike out the plea extremely perplexing. The defendant, the Baltimore & Ohio, had established certain rules governing employment of brakemen. They had to undergo a physical examination to show them physically fit for their duties. Plaintiff, the company alleged, being over the required age and physically unfit, got another man to assume his name and be examined and secure the medical examiner's report, on which plaintiff got the employment of brakeman, in which employment, fraudulently obtained, he was injured. The court considered the question a new one, that of a man over (not under) age, charged to be physically incompetent under the company's rules, securing by the fradulent personation of another a service of danger and responsibility, and, notwithstanding his fraud and deceit, seeking to hold the defrauded company responsible for an injury sustained by him in a place where he had no legal or other right to be. The plaintiff's motion to reject the plea was overruled. Following the filing of this opinion the case was dismissed on plaintiff's motion and at his costs—Stafford v. Baltimore & Ohio, 262 Fed. 807.

United States Supreme Court

Railroads Not Bound to Operate at a Loss

In an action seeking prohibition of an order of a Florida state court confirming a sale at foreclosure of the Ocklawaha Valley for the purpose of being dismantled by the purchaser, judgment granting the prohibition being affirmed on another ground, Mr. Justice Holmes said: "Apart from statute or express contract people who have put their money into a railroad are not bound to go on with it at a loss if there is no reasonable prospect of profitable operation in the future. (Brooks-Scanlon Co. v. Railroad Commission of Louisiana, 251 U. S. 396). No implied contract that they will do so can be elicited from the mere fact that they have accepted a charter from the state and have been allowed to exercise the power of eminent domain. Suppose that a railroad company should find that its road was a failure, it could not make the state a party to a proceeding for leave to stop, and whether the state would proceed would be for the state to decide. The only remedy of the company would be to stop, and that it would have the right to do without the consent of the state if the facts were as supposed. Purchasers of the road by foreclosure would have the same right."

The state court's judgment was affirmed because the prohibition excluding from the decree the words purporting to authorize dismantling the road did not cut down the future purchaser's rights, any more than did the presence of those words enlarge them. Therefore the action of the State Supreme Court was not open to objection under the federal constitution, although it may be that it hardly would have been taken if the authority to dismantle had not sounded more absolute than it could be in fact, considering the nature of the proceeding. Without previous statute or contract to compel the company to keep on at a loss would be an unconstitutional taking of its property. But the prohibition did not compel the company to keep on; it simply excluded a form of authority from the decree that gave the illusion of a power to turn the property to other uses that could not be settled in that case.—Bullock v. State of Florida. Decided January 17, 1921.

State Power to Abolish Grade Crossings

The Supreme Court of the United States has affirmed judgments of the New Jersey Supreme Court and Court of Errors and Appeals (89 N. J. L. 57, 90 N. J. L. 672), sustaining an order of the Board of Public Utility Commissioners of New Jersey, of April 20, 1915, directing a change in 15 places in the city of Paterson, where the Erie now crosses streets at grade, by carrying 14 of the crossings under, and one, at Madison avenue, over the railroad, at the railroad's expense.

"Grade crossings" the court says, "call for a necessary adjustment of two conflicting interests—(a) that of the public using the streets and (b) that of the railroads and the public using the railroads. Generically the streets represent the more important interest of the two. There can be no doubt that they did when these railroads were laid out, or that the advent of automobiles has given them an additional claim to consideration. They always are the necessity of the whole public, which the railroads, vital as they are, hardly can be called to the same extent. * * * It is said that if the same requirement were made for the other grade crossings the company would soon be bankrupt. That the states might be so foolish as to kill a goose that lays golden eggs for them, has no bearing on their constitutional rights. If it reasonably can be said that safety requires the change, it is for them to say whether they will insist upon it, and neither prospective bankruptcy nor engagement in interstate commerce can take away this fundamental right of the sovereign of the soil. To engage in interstate commerce the railroad must get on to

the land, and to get on to it must comply with the conditions imposed by the state for the safety of its citizens. Contracts made by the road are made subject to the possible exercise of the sovereign right. If the burdens imposed are so great that the road cannot be run at a profit it can stop, whatever the misfortunes the stopping may produce. Intelligent self-interest should lead to a careful consideration of what the road is able to do without ruin, but this is not a constitutional duty. In the opinion of the courts below the evidence justified the conclusion of the board that the expense would not be ruinous. * * * If we could see that the evidence plainly did not warrant a finding that the particular crossings were dangerous, there might be room for the argument that the order was so unreasonable as to be void. The number of accidents shown was small, and if we went upon that alone we well might hesitate. But the situation is one that always is dangerous. The board must be supposed to have known the locality. * * * Upon the whole matter, while it is difficult to avoid the apprehension that the state officers hardly gave due weight to the situation of the company as a whole in their anxiety for the well being of the state, we are of opinion that they did not exceed their constitutional powers."—Erie v. Board of Public Utility Commissioners. Decided January 3, 1921. Opinion by Mr. Justice Holmes. The Chief Justice, Mr. Justice Van Devanter and Mr. Justice McReynolds dissent.

Order Requiring Restoration of Train Service Held Invalid

The St. Louis-San Francisco main line extends from St. Louis to Memphis—305 miles. As originally constructed it turned sharply southeastward at Hayti, Missouri—220 miles from St. Louis—ran thence seven miles to Caruthersville, a city of 4,000 people, thence northwestward nine miles to Grassy Bayou and thence south. A cut-off between Hayti and Grassy Bayou—six miles—became part of the main line in 1904 and thereafter through freight and freight-passenger trains passed that way. The through day passenger trains—Nos. 801 and 802—continued to move along the old line until August, 1913, when they were routed over the cut-off. At the same time two new daily passenger trains were put on and operated between Blytheville, Ark., and Cape Girardeau, Mo., by way of Caruthersville. The Missouri Public Service Commission directed the railroad to restore trains 801 and 802 to the route followed prior to 1913 and the State Supreme Court approved this action. The Supreme Court of the United States was asked by the railroad to declare the order invalid because it unduly burdens interstate commerce. The court considers the point well taken.

Fourteen local daily passenger trains move in and out of Caruthersville—seven each way. Some of these make close connections with all through trains at Hayti. The cars in these locals are not of the highest class, but apparently the trains afford fair facilities for reaching and leaving Caruthersville without serious delay or great inconvenience. But if service is deficient there is an easy remedy by means other than detours of the through trains. Applying the well established principles announced in C. B. & Q v. Wisconsin, 237 U. S. 220, 226, to these facts, the Supreme Court considers that the fourteen trains meet the reasonable requirements of Caruthersville and that the commission's order unduly burdens interstate commerce. Compliance with it would require the railroad to maintain sixteen more miles of track at the high standard essential for the through trains, and to move these trains ten miles further. The burden certainly would not be less serious than those which were condemned in some if not all of the following cases, in which the United States Supreme Court has made a similar decision: Gladson v. Minnesota, 166 U. S. 427; Lake Shore v. Ohio, 173 U. S. 285; A. C. Line v. N. C., 206 U. S. 1; Mo. Pacific v. Kansas, 216 U. S. 262; Cleveland, C. C. & St. L. v. Illinois, 177 U. S. 514; Mississippi R. R. Com. v. I. C., 203 U. S. 335; A. C. L. v. Wharton, 207 U. S. 328. The judgment of the lower court was therefore reversed. Mr. Justice Pitney and Mr. Justice Clarke dissented, without opinion.—S. L. & S. F. v. Mo. P. S. Com. Decided January 17, 1921. Opinion by Mr. Justice McReynolds.

Foreign Railway News

China to Buy Cars and Locomotives

Twenty-seven Chinese banks have agreed to loan $6,000,000 Mexican to the Ministry of Communications for the purchase of cars and locomotives, according to a cablegram received from Commercial Attache Julean Arnold at Peking. The Chinese banks will control expenditures and will make cash payments to the manufacturers of the equipment. Bids will be called for in about three months.

New Road from Black Sea to Baltic

The construction of a new railway from the Baltic to the Black Sea will be financed by the Baldwin Locomotive Company, according to a press despatch from Warsaw. Agreement for the building of the line was reached at a conference attended by Premier Stamboulinski of Bulgaria, President Pilsudski of Poland and representatives of the Baldwin company and the Morgan firm. It is said that the formal contract will be signed within a month and the actual construction will be undertaken by the close of the year. The proposed line will open up the great oil fields of Eastern Galicia and Bessarabia.

November Export of Cars

Exports of cars in November show the same reduction over the large shipments of previous months as did the totals for October. Only 3 passenger cars, valued at $30,000, were exported. Freight car exports totaled 949, valued at $1.608,474, and car parts exported were valued at $478,617. The detailed report by countries as compiled by the Bureau of Foreign and Domestic Commerce follows:

Couneries	Passenger, freight and other				Parts of cars
	Number	Dollars	Number	Dollars	Dollars
France	..	.....	320	600,530	2,874
Italy	..	.....	...	.....	1,571
Norway	..	.....	...	.....	6,943
Spain	..	.....	...	.....	38,629
Sweden	..	.....	10	31,000	.....
England	..	.....	...	.....	8,372
Canada	1	10,000	29	85,432	113,198
Guatemala	..	.....	...	.....	1,320
Honduras	..	.....	...	.....	486
Nicaragua	..	.....	3	11,163	.....
Fanama	..	.....	...	.....	1,394
Salvador	..	.....	...	.....	20
Mexico	2	20,000	131	171,523	7,179
Newfoundland, etc.	..	.....	...	.....	4,050
Trinidad and Tobago	..	.....	...	.....	150
Cuba	..	.....	420	679,606	118,879
Haiti	..	.....	...	.....	725
Dominican Republic	..	.....	...	.....	15,651
Argentina	..	.....	...	.....	13,635
Bolivia	..	.....	...	.....	2,583
Brazil	..	.....	36	29,220	15,101
Chile	..	.....	...	.....	411
Colombia	..	.....	...	.....	11,277
Ecuador	..	.....	...	.....	5,901
Peru	..	.....	...	.....	578
China	..	.....	...	.....	5,841
British India	..	.....	...	.....	9,251
Dutch East Indies	..	.....	...	.....	8,928
Hongkong	..	.....	...	.....	796
Japan	..	.....	...	.....	51,797
Philippine Islands	..	.....	...	.....	26,175
British South Africa	..	.....	...	.....	4,902
Total	3	30,000	949	1,608,474	478,617

Track Material Shortage Postpones Construction in South Africa

The South African Railways had, on March 31 last, 1,700 locomotives, with 104 still on order in foreign countries. The acquirements for the year ending on that date totaled 95. There were also 122 main line coaches, 77 suburban coaches, 996 freights cars with trucks and 1,326 four-wheeled freight cars on order from overseas concerns on that date. These totals are in addition to some 174 passenger cars and 927 freight cars which were under construction in the company shops. The administration has had to abandon any

comprehensive plans for new construction of any considerable importance in the immediate future because of the impossibility of getting materials, particularly rails and ties.

November Exports of Steam Locomotives

The figures for the exports of steam locomotives in 1920 are available for only eleven months, but these totals exceed those of any previous year. The exports for November were 116, valued at $2,909,204. Cuba was the destination of a large part of these shipments. The total of exports to that country was 47 locomotives valued at $1,275,830. The next largest shipments were to Brazil, to which country 28 locomotives valued at $786,529 were consigned. The detailed figures as compiled by the Bureau of Foreign and Domestic Commerce are as follows:

Countries	Number	
Canada	8	$115,359
Nicaragua	1	7,400
Mexico	1	7,500
Cuba	47	1,275,830
Dutch West Indies	1	3,114
Argentina	1	13,850
Brazil	28	786,529
Chile	2	60,089
Peru	2	14,551
Dutch East Indies	5	37,600
Japan	1	6,150
Philippine Islands	6	33,840
Egypt	13	547,392
Total	116	$2,909,204

November Exports of Track Material

Exports of spikes in November exceeded in weight and value the totals for any other month in 1920 with the exception of March. Exports of rails and miscellaneous track material were well above the totals for any other month in 1920. The weight of the spikes exported was 3,979,631 lb. and their value $175,459. The rail shipments totaled 67,708 tons valued at $4,088,626. The value of the miscellaneous track material shipped was $1,279,047. The detailed figures by countries as compiled by the Bureau of Foreign and Domestic Commerce follow:

Countries	Spikes		Steel rails		Switches, frogs, splice bars, etc.
	Pounds	Dollars	Tons	Dollars	Dollars
Belgium	.....	.....	375	25,517	3,383
Denmark	.....	.....	1,529	56,826	3,117
Netherlands	.....	.....	324	16,799	.....
Norway	.....	.....	98	7,202	6,972
Portugal	.....	.....	.....	.....	19
Roumania	.....	.....	.....	.....	123
Russia in Europe	.....	.....	.....	.....	472,828
Spain	.....	.....	951	59,879	155
Sweden	63,942	2,698	2,722	193,406	17,450
England	.....	.....	946	52,865	2,534
Scotland	.....	.....	1,800	74,368	1,097
Ireland	.....	.....	.....	.....	6,726
Canada	40,180	2,185	373	16,359	55,988
Costa Rica	2,800	277	44	2,300	534
Honduras	38,900	1,499	1,641	104,219	6,151
Nicaragua	34,000	2,212	.....	.....	.....
Panama	25,600	1,384	150	9,358	2,007
Salvador	1,200	88	.....	.....	324
Mexico	335,510	20,094	673	41,223	9,970
Newfoundland	.....	.....	.....	.....	377
Barbados	.....	.....	.....	.....	1,415
Jamaica	18,000	2,200	283	19,737	840
Other Brit. West Indies	.....	.....	.....	.....	647
Cuba	1,017,751	46,009	16,288	816,513	173,143
French West Indies	1,040	73	.....	.....	.....
Haiti	5,200	289	.....	.....	.....
Dominican Republic	66,400	3,425	699	44,871	42,409
Argentina	29,400	1,282	7,663	524,588	16,049
Bolivia	.....	.....	.....	.....	4,735
Brazil	792,570	33,823	10,182	668,846	78,584
Chile	10,624	722	674	43,509	8,708
Colombia	120,100	5,609	3,401	223,045	14,233
Ecuador	.....	.....	.....	.....	489
British Guiana	63,668	2,691	.....	.....	.....
French Guiana	2,600	234	.....	.....	2,029
Peru	78,600	4,246	1,812	113,927	27,312
Uruguay	.....	.....	50	3,572	10,000
Venezuela	12,600	820	261	19,585	995
China	305,690	13,036	6	816	3,248
Kwantung	.....	.....	40	2,865	.....
British India	.....	.....	.....	.....	2,416
Straits Settlements	.....	.....	155	10,480	337
Dutch East Indies	14,000	1,106	8,140	535,729	115,597
Japan	150,270	7,821	1,817	114,446	26,174
Australia	.....	.....	20	1,409	19,475
New Zealand	.....	.....	112	8,084	7,733
Other British Oceania	200	30	.....	.....	.....
Philippine Islands	113,860	5,168	2,745	163,372	64,490
British South Africa	.....	.....	1,734	112,911	598
Portuguese Africa	634,926	16,438	.....	.....	66,358
Spanish Africa	.....	.....	.....	.....	1,275
Total	3,979,631	175,459	67,708	4,088,626	1,279,047

Equipment and Supplies

Locomotives

THE CUBA RAILROAD is having 10, 10-wheel locomotives rebuilt at the Eddystone plant of the Baldwin Locomotive Works.

THE COLUMBIAN NORTHERN (South America) is inquiring, through the locomotive builders, for 1 or 2, 2-8-2 type locomotives.

THE BELGIAN STATE RAILWAYS are inquiring, through the locomotive builders, for 100 Consolidation type locomotives.

THE ALABAMA & VICKSBURG is contemplating the purchase of new motive power, including 2 Pacific, 4 Santa Fe and some Mikado and switching locomotives.

CHICAGO, ST. PAUL, MINNEAPOLIS & OMAHA has ordered six Mikado type locomotives and four 6-wheel switching locomotives from the American Locomotive Company.

Freight Cars

THE LOUISVILLE & NASHVILLE is inquiring for 100 caboose cars.

THE NORFOLK & WESTERN is having 600 gondola cars rebuilt at the shops of the Ralston Steel Car Company.

THE CHINESE GOVERNMENT RAILROADS are inquiring, through the car builders, for from 500 to 1,500 freight cars.

THE BERTHA COAL COMPANY, Pittsburgh, Pa., is inquiring for 100, 55-ton steel high side gondola cars and for 100, 55-ton hopper cars.

THE TIENTSIN-PUKOW will be in the market soon, through a New York Japanese export house, for 300 gondola cars of 40 tons capacity.

Passenger Cars

THE PENNSYLVANIA EQUIPMENT COMPANY, 1420 Chestnut street, Philadelphia, Pa., is in the market for 6 second-hand passenger coaches, to be used in workmen's train.

Iron and Steel

THE TOLEDO, ST. LOUIS & WESTERN has ordered 2,000 tons of rail from the United States Steel Corporation.

Miscellaneous

SUZUKI & COMPANY, 220 Broadway, New York, has ordered 1,000 tons of track accessories consisting of splice bars, bolts and nuts, also spikes, from the U. S. Steel Products Company, for use on the South Manchurian Railway.

Photo by International

Supply Trade News

The Chipman Chemical Engineering Company, Inc., has removed its offices from 95 Liberty to 136 Liberty street, New York.

Ralph Lane has been appointed manager of the eastern office, at 3636 Grand Central Terminal building, New York, of the **Mummert Lumber & Tie Company,** Chicago.

The Atlas Valve Company, Newark, N. J., has secured the sole patents and rights to manufacture the Ideal automatic pump governor, by purchase from the Ideal Automatic Manufacturing Company, New York.

Robert M. Eames, export manager of the **Bryant Electric Company,** Bridgeport, Conn., has been appointed general sales manager, with headquarters at Bridgeport, succeeding Frank V. Burton, resigned.

The Roller-Smith Company, New York, has appointed the **J. E. Dilworth Company,** 493 South Main street, Memphis, Tenn., as its representative in the western half of Tennessee, the eastern half of Arkansas and the northern half of Mississippi.

Frank Conrad, consulting engineer of the **Westinghouse Electric & Manufacturing Company,** East Pittsburgh, Pa., has been appointed assistant chief engineer. Mr. Conrad has been connected with the Westinghouse Company for almost 30 years, having joined the company when it was in its first location at Garrison Alley. He began with laboratory work in connection with measuring instruments and became associated with arc lamp design. While working on alternating-current measuring instruments a feeding mechanism requirement for an a-c arc lamp led Mr. Conrad to the idea of using an induction type or eddy current operated disk for an arc lamp feed. This led directly to the original conception of the disk type induction indicating a-c voltmeters and ammeters and subsequently to the original round type Westinghouse watt-hour meter, which he designed and brought out in 1897. The radio apparatus developed by Mr. Conrad during the war was a great factor in the success of the activities of the Navy and War departments.

F. Conrad

Albert M. Wolf and **Lawrence M. Harper** have become associated under the firm name of **Wolf & Harper, Engineers,** in order to conduct a general engineering business with offices at 7 W. Madison street, Chicago. Mr. Wolf has, for the past 10 years, been connected with the Condron Company, Engineers, Chicago, as principal assistant engineer in charge of design for five years and as engineer and secretary of the company for two years. He has also served in the engineering department of the Chicago, Milwaukee & St. Paul and the Wisconsin Central. Mr. Harper has been engaged in mechanical and structural engineering for the past 12 years, having in that time served as mechanical engineer for the Condron Company, the Arnold Company and the Northwestern Engineering Company; as engineer in charge of construction with the Foundation Company; and as structural engineer for Herman J. Esser, architects, Milwaukee, Wis. The new firm will specialize in the complete design of commercial and industrial buildings and structures, power plants, the valuation and appraisal of properties, and the preparation of engineering reports.

George A. Post

George A. Post, whose retirement from the presidency of the Standard Coupler Company, New York, on January 31, was announced in the *Railway Age* of January 14, was elected president of the **Hudson River Bridge Corporation** on January 21. This corporation has been organized by a large number of prominent citizens of New York City and New Jersey, to promote the building of a bridge across the Hudson river from Fifty-Seventh street, New York City, to the high ground in New Jersey west of Weehawken, and to establish certain related improvements for passenger and freight traffic at the port of New York. The advocates of the project feel that with the growth of automobile traffic and the rapid increase of population and industry, the need of a bridge grows daily more apparent.

G. A. Post

The offices of the Bridge company will be established at 5 and 7 Dey street, New York. Mr. Post will retain his connections with the railway supply business, with which he has been so long identified through the George A. Post Company, in which his son, George A. Post, Jr., will be associated with him. This company will deal in a selected line of railway materials and supplies, with offices in New York.

George A. Post was born at Cuba, N. Y., on September 1, 1854. He was educated in the public schools and the academy and normal school at Oswego, N. Y. He served with the freight department of the Erie Railroad and in 1872 was assistant to the superintendent of motive power. Mr. Post studied law at night and was admitted to the bar. He was in editorial work for about eight years, from 1883 to 1891. In 1894 he became president of the Standard Coupler Company, New York, from which position he has just resigned. In 1904, he served as chairman of the executive committee of the Railway Supply Manufacturers, and was chairman of the American Railway Appliance Exhibition held in connection with the International Railway Congress in Washington, D. C., in 1905. He organized the Railway Business Association of the United States and served as president of that association from its organization, in 1909, to 1918.

Mr. Post resigned from the Railway Business Association early in 1918, and the *Railway Age*, in its issue of April 12, 1918, in commenting editorially on the work of Mr. Post as head of the association, said the following:

"Mr. Post was the father of the association. He has been president of it ever since its organization. Its principal purpose in the past has been to promote good relations between the railways and the railway supply companies, and to educate public opinion and public officials regarding the railway question. For the leadership of the association, while seeking to accomplish these purposes, Mr. Post has shown that he possesses an excellent equipment. He is a public speaker of rare ability. He is a diplomatist of consummate tact. While always willing to lead, he has always been equally willing, and even anxious, to take counsel with and be guided by the judgment of his associates. The association, under his presidency, has done well the things it set out to do. Recently new conditions have developed in both the railway and railway supply business. The railway supply business has been

confronted by entirely new problems. Mr. Post has never rendered such able and valuable service to it as he has within recent weeks in presenting the point of view, the rights and the problems of its members, to Director General McAdoo, and other officers of the Railroad Administration at Washington."

He is chairman of the Railway Committee, Chamber of Commerce of the United States, and has devoted much time to this service in connection with the Esch-Cummins bill, having furnished a large amount of information to the Congressional committees. He served as a member of Congress from the Fifteenth district of Pennsylvania, from 1883 to 1885.

Edison Storage Battery Company

Frank D. Fagan has been elected vice-president and general manager of the **Edison Storage Battery Company,** Orange, N. J., and **E. M. Cutting,** has been appointed assistant to general manager, both with headquarters at Orange.

F. D. Fagan

Mr. Fagan was born in California and was in the electrical business in San Francisco for a number of years. He then served as manager of the lamp department of the General Electric Company on the Pacific coast, with headquarters at San Francisco, Cal., for over 12 years and now becomes vice-president and general manager of the Edison Storage Battery Company.

Mr. Cutting began railway work in 1888, in the signal department of the Southern Pacific. In 1898, he was appointed supervisor of signals for the Western division and in 1902, in addition to his duties in the signal department, he was given charge of electric train lighting. In 1908, he became engineer of train lighting, heating and ventilation, resigning in 1912 to become Pacific coast manager for the Edison Storage Battery Company, with headquarters at San Francisco, Cal. He remained in that position until September, 1919, when he was appointed manager of the railroad department, with office at Orange, N. J., from which position he subsequently resigned, and now returns to the service of the Edison Storage Battery Company as assistant to general manager, as above noted.

E. M. Cutting

A. D. Graves, manager trade sales of **Pratt & Lambert, Inc.,** Buffalo, N. Y., has been appointed general manager of the company. This position was formerly held by President J. H. McNulty. **C. D. Sproule,** sales manager, western division, at Chicago, has been appointed resident manager with office at Chicago; **J. R. Mickle,** railway sales representative at New York, has been appointed sales manager at New York, and **H. M. Guisey,** assistant resident manager at Buffalo, has been appointed assistant sales manager at New York. The company held a convention from January 10 to 13 in a publicity building recently completed by the company, in Buffalo, N. Y. At this meeting there were a number of interesting addresses made by officers of the company and many papers were presented by the salesmen.

Obituary

John J. Flynn, district manager of the railway sales department, at Chicago, of the **Texas Company,** Houston, Texas, died suddenly at Rochester, Minn., on January 3. Mr. Flynn was born at Paducah, Ky., on June 16, 1866. He began railroad work on the Illinois Central in 1884, and subsequently served consecutively as clerk, yardmaster, and trainmaster, until 1902, when he was appointed superintendent. From 1907 to 1909, he was superintendent on the Trinity & Brazos Valley, at Teague, Texas, and then to 1915 was general manager of the Houston Belt & Terminal Railroad, at Houston, Texas. Since 1916 he has served as district manager of the railway sales department for the Texas Company, at Chicago.

Joseph E. Nelson, president of **Joseph E. Nelson & Sons,** railroad contractors, with offices in Chicago and Kansas City, died suddenly on Friday, January 14, while making a final inspection of the freight and passenger terminal of the Illinois Central at Centralia, Ill. Mr. Nelson was born in New Jersey on January 17, 1857, and came to Chicago in 1869 and grew up in that city. He entered railroad and building construction as a young man and was actively engaged in this work throughout his entire life. In the early eighties he was engaged as construction superintendent on the extension of the Chicago & North Western in Nebraska. In 1889 he served as general superintendent on the construction of the first buildings for the University of Chicago and later served as superintendent for the William Grace Company on the construction of World's Fair buildings in Chicago. Following the completion of this work in 1893, he entered general building contracting on his own account and a year later began specializing in railroad structures. During the late nineties he was engaged in extensive work on the Chicago & Alton and the Atchison, Topeka & Santa Fe and during the last 20 years carried on building construction for practically all of the middle western railroads. In 1908 he organized the contracting firm of Joseph E. Nelson & Sons and was actively engaged in the management of this contracting firm up to the time of his death.

J. E. Nelson

Trade Publications

TRAIN OPERATION BY SIGNAL INDICATION.—Bulletin No. 3 of the series bearing this title has been issued by Henry M. Sperry, 347 Madison avenue, New York City. It contains the two articles by Mr. Sperry, published in the *Railway Age* of June 4 and June 11, comparing the time interval method with the space interval method of running trains, and giving numerous historical notes on train despatching and various schemes for economizing train time and facilitating the despatcher's work. Bulletin No. 1, of this series, described the practice on the Susquehanna division of the Erie, and No. 2 gave data on the saving in time accomplished by the use of automatic block signals. These bulletins are issued in the interest of the four principal signal manufacturing companies—the Union Switch & Signal Company; the General Railway Signal Company, the Federal Signal Company and the Hall Switch & Signal Company.

Railway Construction

ATCHISON, TOPEKA & SANTA FE.—This company is accepting bids for the construction of a frame blacksmith shop with dimensions 40 ft. by 72 ft. at Newton, Kan., to cost about $10,000.

ATCHISON, TOPEKA & SANTA FE.—This company, which was noted in the *Railway Age* of December 14 (page 218), as accepting bids for the construction of a one-story brick addition to its machine shop at Argentine, Kan., has awarded the contract for this work to Jerome Moss, Chicago, at an approximate cost of $45,000. The dimensions of the addition will be 102 ft. by 115 ft., and the improvements to be undertaken include the construction of an office, tool room, engine pits and drop pits.

CHICAGO & ALTON.—This company contemplates the construction of a roundhouse at Ridgely Yards, Springfield, Ill.

CHICAGO UNION STATION.—This company is accepting bids and plans to begin operations about February 2 on the work of wrecking the old Chicago & Alton freight house at Harrison street and the Chicago river, Chicago. This work will form the first step toward the construction of the new Chicago mail terminal on which the Union Station Company plans to begin work this spring.

COON BAYOU & ARKANSAS CITY.—The Interstate Commerce Commission has denied this company's application for a certificate authorizing the construction and operation of a line two miles in length from a connection with the Missouri Pacific in McArthur, Ark., to lease an existing line about 1.3 miles in length, and to acquire trackage rights over the Missouri Pacific for a distance of 23.6 miles.

DELAWARE, LACKAWANNA & WESTERN.—This company will, according to present indications, undertake within the next few months separation of grades at East Orange, N. J., to cost in the neighborhood of $4,500,000.

GREAT NORTHERN.—This company is accepting bids for the erection of a 500-ton frame coaling station at Troy, Montana.

GULF COAST LINES.—This company will build a new freight depot at McAllen, Tex., at a cost of approximately $20,000, and will make track rearrangements necessary to serve the new station properly.

KANSAS & OKLAHOMA.—This company has awarded a contract to Strickland & Smedley, Forgan, Okla., for the construction of a line between Forgan, and Liberal, Kan., a distance of 25½ miles, at a cost of approximately $300,000. The company contemplates extending its line to Trinidad, Colo., and has voted a bond issue to help defray the cost of this work.

LOUISVILLE & NASHVILLE.—This company is building yard facilities near Typo, Ky., which will be called Crawford Yard. The company is also constructing approximately 5 miles of second track on the Cumberland Valley division.

UINTAH RAILWAY.—This company has applied to the Interstate Commerce Commission for a certificate authorizing the construction of four branch lines in Uintah County, Utah, respectively 19.36, 3.01, 1.4 and 1.19 miles in length.

TWENTY-FIVE CARS OF EGGS, from Japan and China, started from Vancouver, B. C., on January 8 for the Atlantic Coast. The eggs, with the exception of 1,500 cases for London, England, and 1,000 cases for Montreal, were all consigned to New York, which took approximately 17,500 cases of 30 and 36 dozen each, or about 6,500,000; more than an egg for every man, woman and child in the city.

CASTING LOCOMOTIVE FRAMES IN SMALL UNITS.—In order to overcome the difficulties of casting locomotive frames of unusual length and other long sections, the Metal & Thermit Corporation, New York, recommends that these be cast in shorter units and these units Thermit welded together. By using this method small foundries can undertake the work. The number of parts to be welded will depend on the size of the foundry and available mold and pattern facilities.

Railway Financial News

ALABAMA, TENNESSEE & NORTHERN.—This company has applied to the Interstate Commerce Commission for a loan of $290,000 for five years from the revolving fund, of which $90,000 is to meet pressing maturities and $200,000 is to pay 40 per cent of the cost of 200 freight cars and 7 locomotives which it is proposed to purchase through a car trust.

BALTIMORE & OHIO.—This company has been authorized by the Interstate Commerce Commission to issue $3,000,000 of refunding and general mortgage bonds, series B, to exchange them for an equivalent amount of refunding and general mortgage bonds, series A, and to pledge $3,000,000 of the series A bonds and $10,000,000 of series B bonds with the director general of railroads as security for its promissory note for $9,000,000, representing a general balance of $9,000,000 due to the United States, growing out of federal control, to be funded for 10 years.

This company has applied to the Interstate Commerce Commission for authority to pledge from time to time certain securities now held in its treasury, nominally issued, as security for short-term notes permitted to be made by the law without the assent of the commission.

CENTRAL OF GEORGIA.—The Interstate Commerce Commission has approved a loan of $237,900 to this company to aid the carrier in providing itself with locomotives. The applicant itself is required to finance about $238,000 to meet the loan of the government.

The commission had previously approved a loan of $815,000 to this company which was not perfected because of the requirement that it finance the balance of its requirements at not exceeding 7 per cent. The company at that time had ordered 7 mountain type locomotives and 17 passenger cars and was negotiating for 800 freight cars. The company now states that it does not contemplate the purchase of new equipment, except the 7 locomotives and the 17 passenger cars, which it proposes to finance by an issue of $650,000 of equipment trust certificates and the loan of $237,900, which it asks the commission to substitute for the original loan.

The Central of Georgia has been authorized by the Interstate Commerce Commission to procure the authentication and delivery of $998,000 of its refunding and general mortgage 6 per cent bonds and to pledge or repledge from time to time part or all of the bonds as security for advances under section 209 of the transportation act, or for loans under section 210, or for notes.

CHICAGO, MILWAUKEE & ST. PAUL.—John D. Ryan, president of the Anaconda Copper Mining Company, has resigned as a director of this road. Mr. Ryan's resignation was in compliance with Section 10 of the Clayton Act, prohibiting interlocking directorates. He is a director and a large stockholder of the Montana Power Company, which supplies power to the Chicago, Milwaukee & St. Paul.

CHICAGO & WESTERN INDIANA.—This company has applied to the Interstate Commerce Commission for authority to issue $329,000 of its 4 per cent consolidated mortgage bonds for the purpose of retiring and refunding a like amount of general mortgage bonds.

HUNTINGTON & BROAD TOP RAILROAD & COAL COMPANY.—The directors have declared a dividend of 75 cents per share (1½ per cent) on the preferred stock, payable February 15 to holders of record February 1. This is the first dividend paid on the preferred stock since January 25, 1908, when a distribution of 3½ per cent was made. President Carl M. Gage says: "The earnings are exceptionally good. We are getting along very comfortably and have a considerable surplus. There is no unpaid indebtedness outside of funded debt, and altogether the company is in a much better position than for several years."

INDIANA HARBOR BELT.—This company has applied to the Interstate Commerce Commission for authority to issue a one-year

promissory note at 6 per cent for $23,020 to Walter E. Meyn in connection with the purchase of some land; also for authority to assume liability in respect of $354,000 of 7 per cent equipment trust certificates.

LEHIGH VALLEY.—The segregation of this company's coal properties has caused the withdrawal of E. E. Loomis, president of the railroad; E. T. Stotesbury, D. G. Reid and W. H. Moore, as directors of the Lehigh Valley Coal Company. The board of the latter now comprises: F. M. Chase, president; F. W. Wheaton, vice-president; E. D. Kenna, W. H. Conningham, Theodore S. Barber and Samuel McCraen.

Harry E. Trexler, of Allentown, Pa., has been elected a director of the Lehigh Valley Railroad, succeeding Dr. Henry S. Drinker.

MISSOURI PACIFIC.—The Interstate Commerce Commission has approved a loan of $1,200,000 to this company to aid it in acquiring 25 Mikado freight locomotives, and 15 six-wheel switching locomotives at a total estimated cost of about $2,400,000. The company itself is required to finance about $1,800,000, including the entire cost of five Mountain type and five Pacific type passenger locomotives, at a total estimated cost of about $680,000.

This company has applied to the Interstate Commerce Commission for authority to issue $1,836,000 of 6½ per cent equipment trust certificates representing 60 per cent of the cost of 50 locomotives, the balance to be financed from the loan of $1,200,000, which has been approved by the commission. The certificates have been subscribed for by Kuhn, Loeb & Co. at 96.

PENNSYLVANIA.—Requests for proxies for the annual meeting of the stockholders, which will be held in Philadelphia on March 8, were mailed on January 25. Accompanying each proxy is a circular letter from President Samuel Rea, with reference to the subjects to be acted upon at the meeting. As previously noted in this column, January 14, these include:

(a) Ratification of long-term leases of 16 railroad properties now constituting portions of the Pennsylvania System and controlled through ownership of all or practically all of their capital stock,—the most important being the Pittsburgh, Cincinnati, Chicago & St. Louis (the "Panhandle"), the Grand Rapids & Indiana, and the New York, Philadelphia & Norfolk.

(b) Authorization of an increase in the company's indebtedness of $100,000,000.

(c) Changes in the dates of the annual meeting and the annual election, which are now held, respectively, on the second and fourth Tuesdays of March, so that they will be held hereafter on the second and fourth Tuesdays in April.

In his letter, President Rea says concerning the financial matters:

"Authority to increase the indebtedness of the Pennsylvania Railroad Company to the extent of $100,000,000 is, in the judgment of your management, necessary; for while a balance of $64,000,000 of former authorization remains unissued, your management must be in a position to assist its subsidiaries in their financing, especially as a large part of this year's maturing obligations are those of the Pennsylvania Company. In order, therefore, that your company may be able, in its own behalf, and to assist its subsidiaries, should assistance be found necessary, to provide for maturing obligations; the settlement of accounts with the United States Government for expenditures upon the property and for equipment during federal control; and for such additional equipment and facilities as may be essential to further promote the development and economical management of the property; you will be asked to authorize the above increase to be made in such amount, and at such times as your board of directors may deem necessary, through the issue of bonds or other evidences of indebtedness, in such form as may be found best for the interests of the company."

As a two-thirds vote of the stockholders, now numbering over 133,000, is required by various state laws on the proposals relating to the leases and the changes in dates of the annual meeting and election, unusual efforts will be made this year to obtain the necessary proxies. For this reason Mr. Rea, in his circular letter, urges all stockholders who are unable to attend the meeting in person not to fail to send in their proxies.

SOUTHERN.—The Interstate Commerce Commission has approved a loan of $3,625,000 to this company to aid the carrier in providing itself with new equipment. The applicant itself is required to finance $8,925,000 to meet the loan of the government.

DIVIDENDS DECLARED

Bellefonte Central:—50 cents, payable February 15 to holders of record January 25.

Chicago, St. Paul, Minneapolis & Omaha:—Common, 2½ per cent semi-annually; preferred 3½ per cent semi-annually; payable February 21 to holders of record February 1.

New Orleans, Texas & Mexico:—Common, 1½ per cent, quarterly, payable March 1 to holders of record February 18.

Pullman Company:—$2, quarterly, payable February 15 to holders of record January 31.

Reading Company:—Preferred, 1 per cent, quarterly, payable March 10 to holders of record February 18.

Railway Officers

Executive

W. M. Wardrop, general superintendent on the Pennsylvania, with headquarters at Grand Rapids, Mich., has been elected vice-president of the Grand Rapids & Indiana, with the same headquarters, effective January 18. Mr. Wardrop will retain his former duties as general superintendent.

C. D. Mackay, assistant to the vice-president of the High Point, Randleman, Asheboro & Southern, Yadkin, Carolina & Northwestern, Tallulah Falls, Hartwell, Danville & Western and Blue Ridge (all subsidiaries of the Southern), has been appointed vice-president of these lines and general agent for the receiver of the Hawkinsville & Florida Southern.

Financial, Legal and Accounting

E. F. Morgan has been appointed assistant auditor on the Chicago, Burlington & Quincy, with headquarters at Chicago, effective January 1. He will have jurisdiction over valuation accounts.

W. H. Burns, general auditor of the Chicago, Rock Island & Pacific, has been placed in charge of the accounting department following the resignation of F. Nay, vice-president and comptroller.

A. L. Parmellee, general division accountant on the Pennsylvania, with headquarters at Grand Rapids, Mich., has been appointed secretary and auditor of the Grand Rapids & Indiana, with the same headquarters, effective January 18. Mr. Parmellee will retain his former duties as general division accountant.

Operating

W. C. Barnwell, chief despatcher of the Southern at Macon, Ga., has been promoted to trainmaster with headquarters at Valdosta, Ga.

A. E. Marsh, trainmaster on the Southern, with headquarters at Macon, Ga., has been promoted to superintendent of the Jacksonville terminal.

A. McFatridge, freight claim adjuster of the Southern, has been appointed chief despatcher of the St. Louis division with headquarters at Princeton, Ind.

F. S. Rosseter has been appointed assistant superintendent of the Chapleau division of the Canadian Pacific, with headquarters at Chapleau, Ont., effective January 16, succeeding W. R. Boucher, resigned.

George Masten, superintendent of the Norfolk & Portsmouth Belt Line, has been appointed superintendent of the Norfolk division of the Virginian with headquarters at Victoria, Va., succeeding **W. A. Gore,** who has been transferred to Princeton, W. Va., as superintendent of the New River division.

J. K. McNeillie, superintendent of the Susquehanna division of the Delaware & Hudson with headquarters at Oneonta, N. Y., has been detailed to the office of the general manager at Albany, N. Y., effective January 15. **M. F. Leamy,** superintendent of the Champlain division, with headquarters at Plattsburg, N. Y., has succeeded Mr. McNeillie at Oneonta. **H. M. Gargan** has succeeded Mr. Leamy as superintendent of the Champlain division.

J. G. Clements, who has been appointed superintendent of the Southern with headquarters at Somerset, Ky., was born at Decatur, Ill., December 13, 1879. He entered the service of the Wabash in 1894 as a brakeman and switchman and resigned the following year to become a brakeman on the

Chicago & Alton. He went to the Illinois Central in 1896 as a brakeman and served subsequently as a switchman, yardmaster and conductor. In 1906 he entered the service of the Cincinnati, New Orleans and Texas Pacific as a conductor. The same year he was appointed general yardmaster of the Chattanooga terminal. The following year he was appointed trainmaster, which position he held until his appointment as superintendent of the Cincinnati, New Orleans & Texas Pacific division of the Southern.

Traffic

T. W. Brahan has been appointed commercial agent on the Southern, with headquarters at Hattiesburg, Miss.

L. W. Gent has been appointed commercial agent on the Louisiana & Arkansas, with headquarters at Kansas City, Mo.

M. P. Cunningham has been appointed commercial agent of the Grand Trunk with headquarters at New Haven, Conn., effective January 17.

A. M. Farrell has been appointed general freight and passenger agent of the Chicago, Ottawa & Peoria, with headquarters at Joliet, Ill.

H. E. Dickinson has been appointed general agent on the San Francisco-Sacramento, with headquarters at Chicago, effective January 15.

T. B. Montgomery has been appointed general freight agent of the Northern Pacific, with headquarters at St. Paul, Minn., effective January 1.

D. W. Vaughan has been appointed northwestern traffic agent of the Central of Georgia with headquarters at Chicago, Ill., effective January 20.

L. J. Trexler has been appointed general freight and passenger agent of the Kalamazoo, Lake Shore & Chicago, with headquarters at Lawton, Mich., effective January 1.

E. M. Lane, assistant to the general freight agent of the Southern with headquarters at Cincinnati, Ohio, has been appointed assistant to the freight traffic manager with the same headquarters.

W. C. Cathcart has been appointed general freight and passenger agent of the Maryland & Pennsylvania, with headquarters at Baltimore, Md., succeeding W. A. Johnson, resigned to accept service elsewhere.

Mechanical

J. W. Sasser, superintendent of motive power of the Norfolk Southern, has resigned to become superintendent of motive power of the Virginian with headquarters at Princeton, W. Va., effective January 1, succeeding **R. E. Jackson,** resigned.

A. Sturrock, whose promotion to assistant superintendent of motive power on the Canadian Pacific, with headquarters at Winnipeg, Man., was announced in the *Railway Age* of January 7 (page 174), was born on July 27, 1883, at Dundas, Ont. He entered railway service in 1901 as a machinist in the Stratford, Ont., shops of the Grand Trunk. After a year's service with the Grand Trunk, Mr. Sturrock came to the United States and was employed as a machinist, first on the Atchison, Topeka & Santa Fe, and later on the Denver & Rio Grande. His service with the Canadian Pacific began in July, 1904, when he was employed as a machinist in the company's shops at Winnipeg. He was promoted to locomotive foreman in 1911, with headquarters at Fort William, Ont., a position which he held until 1913, when he was transferred to Vancouver, B. C. In April, 1914, he was again promoted, being made general locomotive foreman of the shops of the Canadian Pacific at Ogden, Alta. A year and a half later Mr. Sturrock was made division master mechanic, with headquarters at Cranbrook, B. C., and in January, 1915, he was promoted to general master mechanic of the Alberta district, with headquarters at Calgary, Alta. At the time of his recent promotion he was serving as general master mechanic of the British Columbia district, with headquarters at Vancouver, where he had been transferred in April, 1915.

Engineering, Maintenance of Way and Signaling

C. Duckworth, who was appointed division engineer on the eastern division of the Western Pacific, with headquarters at Elko, Nev., has resumed his position as roadmaster, with the same headquarters, effective January 1, the position of division engineer having been abolished throughout the Western Pacific system.

H. F. McFarland, Jr., whose appointment as chief engineer of the Wichita Falls & Southern, with headquarters at Graham, Tex., was announced in the *Railway Age* of December 10 (page 1048), was born on April 2, 1885, at Corsicana, Tex. He was educated at Washington University and entered railway service in 1908 as an inspector of bridge and masonry construction on the St. Louis & San Francisco. In July, 1909, he was made senior draftsman in the office of the engineer of bridges, and in December, 1912, he was promoted to assistant engineer with jurisdiction over the general design of steel and concrete structures. Mr. McFarland enlisted in the army in June, 1918, being commissioned lieutenant and assigned to the Twelfth Engineers. He was later promoted to captain and served in France until June, 1919. In July, 1919, upon his return to civil life, Mr. McFarland accepted an appointment as chief engineer of the Wichita Falls, Ranger & Fort Worth, taking direct charge of the location and construction of that road from Dublin, Tex., to Breckinridge. His recent appointment has given him supervision of the construction of the Wichita Falls & Southern from Newcastle, Tex., to Breckinridge.

Purchasing and Stores

J. E. Wharton, division storekeeper on the Pennsylvania, with headquarters at Toledo, O., has been appointed storekeeper, maintenance of equipment department, with the same headquarters, effective January 15. The position of division storekeeper has been abolished.

Obituary

Henry F. Houghton, formerly general manager of the Cleveland, Cincinnati, Chicago & St. Louis, died at Indianapolis, on January 10.

Benjamin Thomas, at one time general manager and president of the Chicago & Western Indiana and for a long time chairman of the General Managers' Association, died at his home in Chicago, on January 6.

William M. Coleman, general counsel of the Hudson & Manhattan, committed suicide at Washington on January 21 by jumping from a tenth-story window of the hotel across the street from the Interstate Commerce Commission.

Sydney Williams, formerly assistant to vice-president in charge of purchases of the Union Pacific System, at New York, previous to 1918, died on January 9, at the home of his daughter in Montclair, N. J., at the age of 55. Mr. Williams graduated from the Massachusetts Institute of Technology in 1887, with the degree of civil engineer. From 1895 to 1903 he was controller and general superintendent of the Pennsylvania Coal Company and in the latter year became associated as assistant to W. V. S. Thorne, then director of purchases for the Southern Pacific System, Union Pacific System and other allied Harriman lines. After the separation of the Southern Pacific System and the Union Pacific System in 1913, Mr. Thorne remained with the Union Pacific System and Mr. Williams was retained as his assistant until 1914, when Mr. Thorne resigned. Mr. Williams then became assistant to vice-president in charge of purchases, and he continued in this position for some time after federal control, resigning in December, 1918, to engage in other activities. He did not return to the railroad field at the conclusion of federal control.